

INCA AND PRE-INCA POTTERY  
(Pottery from Cusichaca, Department of Cuzco, Peru)

by

SARA WENDY LUNT

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University Institute of Archaeology, University College.

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ABSTRACT

Although important studies have been made of the Andean pottery of the Inca Empire and its predecessors, these studies usually have been based on pottery collections which lack good archaeological contexts. The usual interpretative framework for ceramic variation has been the hierarchical social organisation of the Inca Empire described in the Spanish chronicles.

In this paper, the pottery differs from the previously studied collections in two ways: first, in the classification and study methods, and secondly in its derivation.

Pottery fabric has been studied, and used as a primary discriminator. The potential of fabrics for identifying imported pottery is useful, in order to consider the economic activities within the Inca Empire and across its borders. Source areas are considered, both in terms of geological environment and pottery workshops. Potting techniques are examined in relationship to workshop organisation, to formal and decorative characteristics, and to marketing and consumer requirements.

The pottery derives from excavated, stratified deposits. This chronological control allows developments in the pottery to be discussed. A period of intense mercantile activity, before the Inca occupation of the area, can be identified. The deposits are

distributed amongst five sites, all with Inca-period remains, which means that contemporary variation can be considered. Each site has a particular kind of ceramic assemblage, and the reasons for this, and for the lack of concordance between assemblages and specific types of buildings, are discussed.

For my parents

The past is a foreign country: they do things differently there.

L.P. Hartley, "The Go-Between", 1953.



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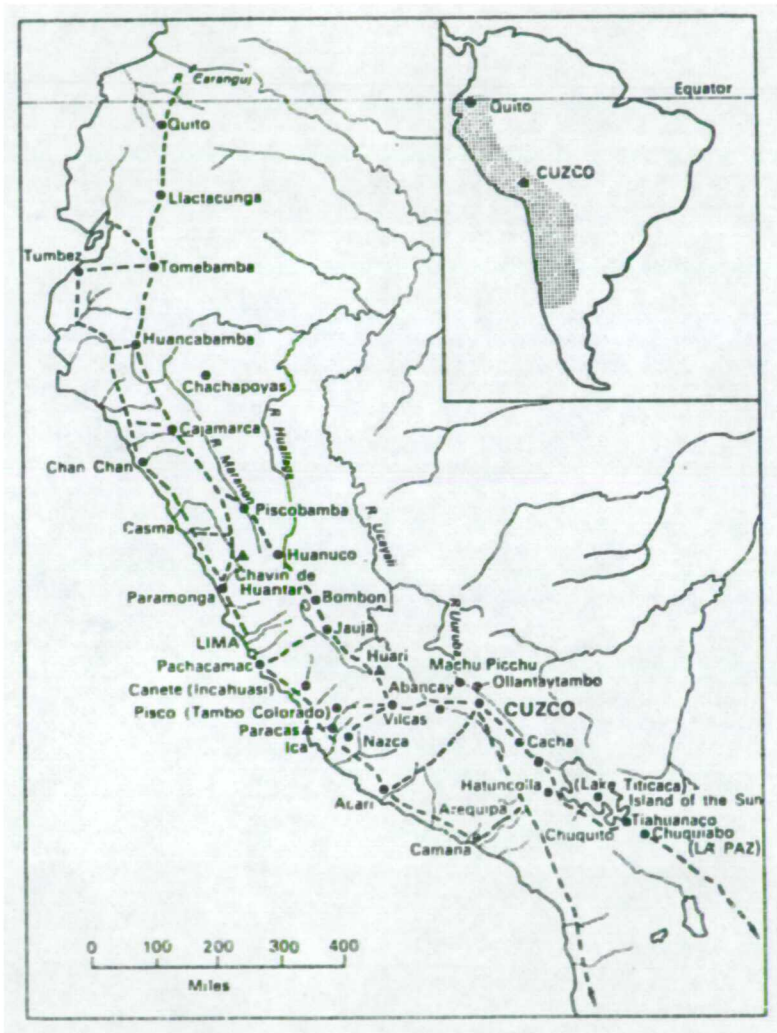
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## CHAPTER ONE. Introduction

The Inca civilisation is not an archaeological culture. It is known to us because many details of Inca life were recorded after the Spanish conquest of 1532 by men with a European point of view; and the Incas themselves left tangible traces in the shape of their descendants, some grandiose architecture, and a few glamorous artefacts. Such things lend themselves easily to popularisation, and books, television documentaries, films and plays display a culture which is old, exotic, rich and authoritarian, set in a dramatic landscape, and ruled by men whose appearance, names and personalities are known to us.

Serious studies of the Incas begin with the same evidence as the popular works, and end with a not dissimilar picture. Research has focused on the written records (see Note: Chronicles, p.146), which were compiled for Spanish administrative reasons or for general interest in the years following the conquest. Their various combinations of oral tradition, myth and selective personal observation have been compared, assessed and sieved for nuggets of truth, some of which may have tangible correlates. This is the point from which other studies have taken off: their results are then referred back to the written evidence for synthesis and interpretation. Therefore, given the emphasis which exists in the records, it is not surprising that the Incas themselves dominate the pictures which emerge. Provinces and people are seen through a mesh of Incan administration, social and political organisation, judicial systems and religious beliefs, and as contributing to, or

reacting against, the Imperial scheme. Small populations living entirely beyond the jurisdiction of the Empire, or immediately preceding it, are almost invisible; and we describe them, for convenience's sake, as 'non-Inca', or 'pre-', 'proto-' or 'early Inca'. So we view the Inca Empire on its own terms, effectively cut off from any lowly origins, and dominating the landscape.

But if we want to put the Incas into any kind of cultural or chronological context, then we have to look at the peripheral and earlier populations. To compare them with the Incas, we should use the same kind of evidence in order to have a balanced view. If we want to trace a sequence of events from just before, and during, the short time-span of the Empire, we need a finely-divided chronological framework. And if we want to add substantially to our knowledge of Inca life, then we need some new categories of information. The written evidence is either lacking or unsuitable, and so we must rely on archaeology.

From 1977 to 1985, excavations in the Cusichaca valley north of Cuzco (see frontispiece, p.14, and Appendix 7, maps 1 and 7), revealed a series of stratified deposits containing quantities of pottery. On one site, there is a continuous sequence of deposition from the pre-Inca period (see Chronology, p.281), spanning the beginning of the local Inca occupation, and ending with the abandonment of the site at the end of the Inca period. The other four sites contain soils associated with the Inca occupation. Each site has a distinctive suite of Inca buildings. The architecture has been studied by Kendall (1976; 1985), who suggested that

each site was custom-built for one primary purpose in the Inca administration of the area.

Amongst the surviving artefacts, pottery was the most common item, and clearly it had been made, distributed and used in quantity and continuously from the beginning of the known occupation of the valley. The pots displayed many styles of decoration and shape (see 'style' in the Glossary, p.283), not all of them familiar; the pots were made from several kinds of raw material, and a number of manufacturing techniques had been employed. The pottery was distributed through deposits which spanned a significant event (see paragraph above), and it was distributed subsequently on five, very different, contemporary sites. Clearly, there was scope here for research and interpretation at a local level. But, in its latest phases of occupation at least, Cusichaca was not isolated. Its architecture indicated that there was a direct connection with the central Inca administration; and the appearance of some of the pottery suggested that economic links may have been maintained with the Cuzco basin, and perhaps with other areas, during the entire Inca period. So whatever results were obtained from studying the Cusichaca ceramics, some would lead, inevitably, outside the valley.

But can this pottery study contribute significantly to what we know already of the last pre-Spanish cultures? Ceramics are not a high form of art; nor is their manufacture difficult (although difficult to do well) or labour-intensive. The logic which connects this category of low-key domestic refuse with abstract social theories is often hard to follow. But it is part of archaeological work to make such correlations: and if we

review recent ceramic studies in the Andes, it will become clear that there are some general problems which the Cusichaca pottery may elucidate. But emphasis will have to be given to topics such as the location, the organisation, and the methods of pottery manufacture, the distribution in pots from manufactory to consumer, and the appearance of the total ceramic assemblage in certain key contexts.

#### The 'status quo'

In the early 1940s, the Harvard University Expedition to Southern Peru embarked on a programme of reconnaissance and test excavations. One of the aims was to place the Inca Empire within an archaeological context so that its origins in the Cuzco area could be investigated. The pottery, which was collected from the surface of sites in the Cuzco valley and to the south, and from three test excavations adjacent to, and in, the city of Cuzco, was classified by John Rowe (1944).

The classification was based principally on the style of the painted decoration. Vessel shapes and fabrics were described for each style (for 'fabric', see Glossary). Eight styles were identified: of these, seven were similar to one another, sharing decorative motifs, and also vessel forms and the appearance of the fabrics. Rowe suggested that most of the pottery was mass-produced (*ibid.*, 48): the number of decoration elements was small, and their combinations and their positions on the pots were repetitive variations on a limited number of themes; there were few vessel shapes, and each shape was standardised. The prevalence of the pottery in Cuzco, and its association with Inca structures, identified it: 'Cuzco Polychrome', for example, was considered one of the best ceramic

products of the Empire in the Late Horizon Period (see Chronology for this and all Period names), made under Imperial control somewhere in or near Cuzco. Of the remaining decorated pottery, some was grouped together as the eighth style, 'Canchón'; and a number of undecorated wares were grouped together as 'Cuzco Plain' - utilitarian pottery.

'Canchón' resembled Cuzco polychrome in the use of certain design elements, but differed in most other respects. Rowe referred to a "characteristic carelessness of execution" (*ibid.*, 49). Incorporating evidence from the work of Cuzco University in 1942/3, 'Canchón' was re-named the 'Killke Series', which was defined as a group comprising five sub-styles, with a discrete range of shapes and fabrics. Its distribution was similar to that of the Cuzco Inca Series, but evidence for their relative ages was indirect. However, it seemed likely, stylistically, that Killke was the earlier, at least in part, and ancestral to the Imperial wares (Rowe 1963, 199, refers to the Killke Series as "Early Inca").

In the late 1960s Dwyer dug test trenches in Sacsahuaman, the 'fortress' site overlooking Cuzco (Appendix 7, map 7). The stratigraphy was divided into two components, separated by a sterile 'surface'; the anthropogenic soils in both components were thought to be midden material. Pottery decorated in the Killke style was found alone in both components. It was also found by Dwyer in excavations at Minas Pata; and in surface material on other sites in the Cuzco valley, usually mixed with Cuzco Inca pottery. In surface collections made outside the Cuzco valley, Killke *sensu stricto* seemed to be rare: various kinds of 'Killke-related'

pottery were identified, usually associated with Cuzco Inca or Inca-influenced pottery.

Dwyer (1971) defined three successive phases in the Killke Series; he suggested that its origins pre-dated those of the Cuzco Inca Series, to which Killke was probably ancestral. He dated the Killke Series from AD 900 to 1400, and suggested that it was dominant in the Cuzco valley after AD 1100 (Rowe, *ibid.*, 57, places the appearance of the first Inca ruler later than Dwyer's date for the appearance of the style, but during the lifetime of the Series). The evidence which Dwyer used included archaeological position and association; the apparent distributional similarity between Cuzco Inca and Killke pottery; and certain evolutionary tendencies in shapes and in decorative elements in the Killke Series. These tendencies were seen as deriving from a reservoir of geometric designs and vessel shapes current in the Cuzco area before the Middle Horizon Period, and which could be traced through Killke into the Imperial ceramic repertoire.

Concerning the way in which Killke might evolve into Cuzco Inca, Dwyer suggested a reorganisation of artisans by the Incas, with a deliberate selection from the local Killke repertoire, to produce a limited range of standardised, high quality wares for home consumption and export. Thus the latest product of a long and stable ceramic tradition could be transformed rapidly, and without intermediate stages, into the factory wares of the Cuzco Inca Series. Both Rowe and Dwyer suggested that some of the decorative stylistic variation in Killke might be functional, rather than chronological, and it was not suggested that



manufacture of all Killke pottery stopped abruptly when the Cuzco Inca Series swung into production (see paragraph above). Rowe referred to "other wares" in Cuzco (apart from "Inca pottery *par excellence*"), whose "exact significance ... cannot yet be determined, as some may be provincial ... others may have chronological significance or indicate economic differences" (*ibid.*, 43).

The assumption was that the Killke and Cuzco Inca Series were made in the Cuzco area (see below): therefore, in theory, it is only there that the evolution of Cuzco Inca pottery from its antecedents can be seen. Everywhere else, the relationship between the Imperial pottery and all other wares must, of course, be of a different kind. Rowe referred to the "diversity of Inca-date pottery" and he explained, by modern analogy, how potters working in the provinces might have borrowed characteristics from the pottery "of the ruling class" (*ibid.*, 43).

By describing pottery from the Inca capital, Rowe provided a basis for comparison with pottery from a huge area. Previously, collections of material had been made over many years, and 'Cuzco Inca' had been identified, usually in rather cavalier ways, by comparisons with a norm whose own characteristics had not been described methodically. It now became possible, in theory at any rate, to distinguish 'Cuzco Inca' from pottery which was similar only. These latter wares could then be identified as the latest products of regional traditions, distinct from one another, and from the prestigious Imperial 'imports' from which they borrowed superficial details.

The provinces of the Inca Empire are the relevant cultural context for Cusichaca: by any criterion, the capital city was unique. Rowe (1962; 1963b, 18) gives a date of AD 1438 for the beginning of Pachacuti's reign, during which the Empire reached its cultural and territorial apogée. The Empire ended formally with the Spanish conquest of 1532. No evidence suggests any major change in Inca cultural development during those 96 years.

The presence of the Incas in an area can be inferred through references in the chronicles, or architecturally, or by the presence of characteristic artefacts. All three kinds of evidence, each most variable in coverage, suggest that throughout the area which the Incas, according to the chronicles, considered to be their Empire (see frontispiece, p.14 and map in Rowe 1963a, 205), the intensity of their presence was very varied and often slight, particularly at the frontiers, and particularly away from the mountains. Many researchers have shown that there was not one Imperial blue-print for the occupation or management of an area, but many, depending on the potential of the land, its distance from Cuzco, and the size, character and organisation of the indigenous population (see discussions in, for example, Bawden and Conrad 1982; D'Altroy and Earle 1985; Lumbreras 1974; MacWeish *et al.* 1975; Menzel 1959; Murra 1982; Pease 1982; Perrotá and Podestá 1978). But, of course, the Inca presence always marked a departure from the pre-existing local cultural development and, based on the written evidence, this difference can be summarised best as the imposition of a complex, hierarchical social order, through which areas and people could be administered and made useful (see discussions in Julien 1982; Rowe 1982).

In the provinces, pottery collections of the Inca period have, nonetheless, some recurrent characteristics. Those wares which belong to the Cuzco Inca Series comprise the same small number of types, and are usually low in quantity. The local ceramics bear various degrees of similarity to the Imperial styles, but this influence is usually to be seen in the same (easily copied) features, such as long necks, everted rims emphasised with horizontal bands of paint, angular body shapes, and repetitive, geometric painted decoration using chevrons and triangles. At least some local pottery shows no such influence at all. Many other types of pottery are present, and the absolute quantity of pottery is large (see descriptions of assemblages and collections in Julien 1978; Kaufmann-Doig 1978; Menzel 1959 and 1976; Meyers 1975; Tschopik 1950).

Where the evidence exists, it seems that in all these respects these collections differ from their local predecessors. They differ from one another only in the relative percentages of one type of pot to another, in their over-all appearance (as a function of the character of the non-Cuzco Inca wares) and in the kinds of context in which the Imperial wares are found (often within the confines of one site, e.g. Tschopik 1950).

The associated non-ceramic evidence in the burials at Ica (see frontispiece) show that there, Cuzco Inca pottery was considered to be prestigious. Menzel (1976) found an equivalent from within the hierarchical Inca social system for stylistic nuances in individual pots. For this kind of interpretation, her detailed analysis of shape and painted decoration, and the identification of external influences, was

entirely appropriate. Scaled up, the proliferation of types of pots, and the consequent numerous variations in the assemblages, could be explained suitably in terms of the new, complex, social order.

A time scale was provided by Julien's excavation in Puno (see frontispiece, Julien 1978; 1981), in which she identified fluctuations in Cuzco Inca ceramic influence during the Late Horizon Period. As at Ica, Cuzco Inca pottery was found in high status burials.

In these two examples (both using reliable, excavated evidence), the 'standard' of Cuzco Inca pottery as described by Rowe was used to identify the Imperial wares, and to recognise their influence on the indigenous pottery.

Julien (1981, 130ff), Kaufmann-Doig (1978), Meyers (1975), Thompson (1963) and Tschopik (1950), amongst many others, give some weight to the distinction between Inca 'imports' and the Inca 'style' in assessing the relationship between a province and the Empire. This synthesises neatly the assumptions which are made about Cuzco Inca pottery: first, that the standard is comprehensive - i.e. that we know what all Cuzco Inca pottery looks like; secondly, that it was made in the Cuzco area, and exported under Inca control; thirdly, that its chronological span matches that of the Empire; fourth, therefore, that it comprises a meaningful entity which can be used as a basis for interpretation.

But Rowe called his classification a description of a style only, and he acknowledges that it is still far from comprehensive (pers. comm., and

see Menzel 1976, 68; and Meyers 1975, 10). In Cuzco, there have been no large-scale excavations through undisturbed deposits: the most recent excavations, those by Gonzalez in 1981, were limited in area, there was a discontinuity between the pre-Inca deposits and overlying strata, and many of the strata may have been levelling deposits (Gonzalez 1984, 189-204). Therefore, any contemporaneity of Killke and Cuzco Inca pottery has not been demonstrated; the evolution of all of the Killke sub-styles, or

any variation in the Cuzco Inca Series during the short time span of the Empire, have not been observed archaeologically. We do not know the complete range of pottery in use at any one time in any area of Cuzco in the Late Intermediate or Late Horizon Periods, and the contexts from which assemblages of these periods derive have not been adequately described.

Therefore, although some kinds of Cuzco Inca and Killke pottery (*sensu stricto* Rowe and Dwyer) can be identified, such identifications are meaningless, at the moment, in terms of Cuzco itself. Many provincial pottery collections of the Late Intermediate and Late Horizon periods lack reliable archaeological contexts of their own: so there is no independent basis for comparability, either within the provinces or with Cuzco, and consequently no way of distinguishing regional from temporal variation.

For much of the pottery from the provinces, there are no clear-cut stylistic affiliations in any case. Some types may be called 'Killke-related', 'local Inca' or 'provincial Inca', but such labels should be used in loose, descriptive ways only: in degrees of similarity to the Cuzco prototypes there can be no constant, in-built meanings, particularly when

Rowe and Dwyer, amongst many others, have referred to the long-lasting and widespread nature of many formal and decorative ceramic characteristics.

## CHAPTER 2. New approaches

To summarise the current state of ceramic research: using Rowe's descriptions, Cuzco Inca pottery has been identified throughout the area of the Empire. In all cases where associations are reliable, the style of these wares appears to be influential in the latest development of pre-Spanish regional pottery. But it is not the only influence: in any one assemblage there is usually a rich mix of Cuzco Inca, other new wares, and local pottery, all with complex affiliations to one another. In Cuzco, one might expect to see an evolution *in situ* from pre-Inca to Cuzco Inca pottery, but reliable archaeological evidence is lacking with which to observe either chronological or spatial behaviour and association. The traditional framework for interpretation of both Late Intermediate Period and Late Horizon Period pottery collections is derived from the chronicles.

This shows immediately that a comprehensive study of pottery from stratified, Late Intermediate and Late Horizon Period deposits would add substantially to our information. But a number of specific problems have emerged also, suggesting a particular kind of research emphasis.

First, Rowe and Dwyer have referred to the common reservoir of vessel shapes and decoration in the Andes (see Chapter 1). Other criteria are necessary, therefore, to distinguish between

stylistically similar pots and to see whether style groups have any other kind of reality.

Secondly, in recent research, emphasis has been placed on small-scale differences in profiles, as well as on decoration (see Chapter 1, p.23). Manufacturing methods, as well as a potter's satisfaction of a discriminating demand, may account for some of the variations. It is important, therefore, to distinguish between the by-products of a manufacturing process and a deliberate effect, if only to be sure of comparing similar characteristics and giving them their proper weight. And this is so, even if the eventual interpretation of an attribute's significance remain the same.

Third, the relationship between pottery of the Cuzco Inca and Killke Series has been described in terms of workshop reorganisation (Dwyer 1971), and Cuzco Inca pottery looks highly standardised - by implication, it was mass-produced (see Chapter 1, p.18). But these are technological matters, and to consider them properly involves looking at other characteristics, as well as shape and painted decoration.

Fourth, it is assumed usually that both 'Cuzco' Inca and Killke pottery originated in the Cuzco area (see Chapter 1, pp.19, 21). It has been suggested that for Cuzco Inca pottery it was the style which was mobile, rather than the pots themselves: stylistic influence being passed on, as it were, at second hand (Kaufmann-Doig 1978, 725; Kroeber and Strong 1924, 12; Meyers 1975, 17). But the diversity and



size of Late Horizon Period assemblages may be seen as measures of the extent of trade in pottery wares themselves, within the Inca Empire and perhaps across its frontiers. The Imperial control of trade and the strategic use of prestigious items, the presence or absence of a free market economy at any level or on any scale, and the existence and rôle of traditional markets, seasonal fiestas, itinerant salesmen and barter, are important topics; and pottery is a promising category of evidence for investigating them. Therefore, it is necessary to distinguish all imported pottery from local wares, not always easy to do visually (see above, pp.25, 27), particularly if the full range of pottery in an exporting area is not known; and then to identify the areas of origin of the raw materials and the location of the pottery workshops. The distinction between 'local' and 'import' is crucial too, because imported wares have been removed from their own developmental context: they are a biased selection from an unknown original range. The succession of styles in imported wares must be viewed differently, therefore, from that of pottery made on the spot.

Fifth, only by comparing assemblages from undisturbed stratified deposits in their original positions (i.e. not from redeposited soils) is it possible to give ceramic influence, continuity, evolution, and so on, an empirical basis, as the chronological behaviour of individual wares is observed.

Sixth, the identity of an archaeological context may be the only way of understanding the prestige value or function of a pot on that

particular site. Both characteristics may be altered, not only by the nature of the site, but by the availability of other wares.

Seventh, many of the problems to do with Late Intermediate and Late Horizon Period pottery could be resolved simply if temporal and regional variation could be distinguished: the distinctions must be based on detailed, regional studies of reliable, stratified sequences.

Armed with this information, we can discuss the pre-Inca economic relations between Cusichaca and other areas, and trace some developments in styles and technologies of imported ceramics. As the Incas begin to emerge as an identifiable group in the Cuzco area, we can detect fluctuations in the ceramic trade, and identify with some precision new characteristics in much of the imported pottery; and we can follow these new developments into, and through, the Imperial period. We know, from the archives, that the Incas perpetrated some dramatic social upheavals; in Cusichaca, the appearance and quantity of the latest pre-Spanish buildings suggests a very strong Imperial presence, creating new, large concentrations of population. So we expect to see some changes in other categories of evidence. But we shall also be able to detect a substratum of traditional activity, continuing unabated through the Inca occupation.

### CHAPTER 3. The sample and its study

In Chapters 1 and 2 I reviewed at some length the current state of the ceramic research which has centred on the Cuzco area in the Late Horizon Period. This served the purposes of identifying those problems which a study of the Cusichaca pottery could clarify, and of suggesting some appropriate study methods.

It will become clear below that there are still some large gaps in our information, some inherent biases in the sample, and limitations in this, as in any, classification, all of which inhibit the scope of interpretation. But Chapter 4 will show that the scope is still wide enough to include some new information, and that this provides a viewpoint for looking at ceramic characteristics which have already received much attention.

#### A. The sample

Since 1969, c.500,000 potsherds have been excavated or collected from a number of sites in the Cusichaca valley and the surrounding uplands, first by Kendall, and then by members of the Cusichaca Archaeological Project. The nucleus of settlement during the Late Horizon Period was in the lower Cusichaca; half of the sherds come from a group of extensively excavated sites near, or above, the confluence of the Urubamba and Cusichaca rivers (see Appendix 7, map 1). From this 250,000, I have chosen a sample of 50,000 sherds to study.

Most of the sherds from Cusichaca are small, abraded and lack decoration. In the study sample, I include all well-preserved decorated sherds and all rims, handles, bases and distinctively-shaped body sherds, whether well-preserved or not. Although the sample is a small proportion of the whole (c.25%), it is the largest which can be used for detailed work, if I want to see how different characteristics relate to one another.

There are some inherent biases in the sample, and weaknesses in my selection, which will limit the scope of what, eventually, can be said.

1. The number of complete pots is very small, and does not encompass all varieties of ware. There is better preservation in harder fabrics and in the smaller, simpler shapes. Pigment is preserved best on wares which were polished after painting. Construction methods can be seen most clearly on wares which were made piecemeal, and which have broken cleanly at major bonds because of differential drying-out. None of these effects is random; they are characteristic of particular wares, and are influenced by the original technology. This means that there is far more information to be gleaned in some cases than in others, but I shall discriminate in the text between evidence which is not available, and evidence which is absent.

2. Some wares may not be included in the sample: if, for example, no rims, handles or bases of some undecorated wares were excavated. Given the extent of excavation, this seems unlikely.

It is possible that some of the very fugitive decoration may have been unique, but there is no easy way of recovering this information.

3. If all examples of a fabric were considered, its variations might be greater than, or of a different kind from, that described here for each fabric group. But most of the fabrics in the sample are represented by sherds from different parts of pots, and rims and handles seem to display the most extreme variants of a fabric. The evidence shows that each major fabric group is quite distinctive, and I think it unlikely that significantly different information would accrue if the undiagnostic body sherds were included.

I use numbers of sherds throughout: it is impossible to estimate numbers of whole vessels (except for the most uniform shapes, but this removes the basis for comparison between wares) and weights of sherds seemed to offer no advantage over numerical quantity. But I have not demonstrated that the relative proportions of one ware to another in this (non-random) sample are the same as in the whole population. So far as presence/absence of a ware in an archaeological context is concerned, this does not matter, of course. The sample as it stands is the best and largest which could be usefully used; but most of the Cusichaca pottery is very far from being the best. So although I think my sample is representative of the whole collection, proportionately it may not be the epitome of it.

B. How the sample was studied: methods and meanings

Each of the three major ceramic attributes of fabric, form and decoration is usually informative enough to be used alone for classification (Adams 1964, 309). Groups based on them, of course, will mean different things and, in each case, it will be possible to go quite far in interpretation before having recourse to archaeological context.

In the Andes, evidence suggests that there were 'families' of decorative styles and vessel shapes, many of which were traditional, and some widespread. Although this situation is of interest, it may weaken the potency of these two characteristics in any one collection. In the present situation, many pots are not decorated at all, or painted decoration is now hard to discern. Extant traces of decoration conform to similar styles, across a disconcerting range of shapes and fabrics. There is an unavoidable bias in the sample which meant that for some categories, few complete forms can be reconstructed. Only in certain wares are the forms distinctive enough for a rim sherd, for example, to be diagnostic, and it is often hard to be sure of the significance of small-scale modulations in profile.

Fabrics, however, vary a good deal in their fully oxidised clay colour, in the appearance of their fractures, and in the colour, condition and shape of their mineral inclusions. The variety is not random; the same fabric can be recognised as an entirely distinctive collection of characteristics on sherds from different contexts and

sites. So far, then, this attribute seems suitable for classifying the collection.

But as for the meaning of the groups based on differences in fabric: this can be seen in two ways. First, a fabric can be thought of as a piece of "metamorphosed sedimentary rock" (Peacock 1977, 26), and its components can be assigned to geological formations. If specific enough, these formations may be identifiable geographically. But, secondly, even if a raw clay was used as found, a fabric can be seen as an artefact, the first deliberate choice made in the manufacturing process. It then becomes reasonable to consider other relationships: first, to the rest of the manufacturing process. What effect did a combination of minerals have on the way a pot was made and fired? Then, secondly, to shape. Was a fabric contributive to serviceability, and therefore important to the function of a particular kind of vessel? Did it have a prescriptive effect on size or shape? Thirdly, to decoration. Did fabric composition relate to any aesthetic considerations, such as a pot's surface smoothness or its fired colour?

For each fabric group, therefore, there might be a number of corroborative attributes, some related directly to the character of the fabric, some the products of other interactions during the manufacturing process. And several kinds of analytical techniques exist for studying attributes which are the results of physical laws operating on particular combinations of raw materials.

Rye says (1981, 27-8) "the classificatory and control devices used by potters in the past have usually been far less precise than our facility for analysing their results" (compare Kaplan and Levine 1981, 883). And there are choices open at every stage of manufacture which are not technologically determined. But nonetheless the identification of different technological practices (each represented by a distinctive fabric combined with a consistent manufacturing and firing technique) is useful for three reasons:

1. According to ethnographic and archaeological data, technological procedures tend to be conservative and distinctive. In any one area, several may co-exist, resulting from peculiar balances struck between raw material acquisition, size and organisation of the industry, transport of the finished pots, market competition, scale and nature of demand, and so forth. And through time, a procedure may survive, providing an empirical framework in which to place vagaries of decorative style and shape (see discussions in Arnold, forthcoming; Attas 1983; Balfet 1981; Buko 1984; Foster 1965; Kingery 1976; Matson 1960, Nicklin 1971; Peacock 1981; Reece 1979; Rye 1976; Spriggs and Miller 1979; Tschopik 1950).

2. A study of the procedures used for making some of the Cusichaca pottery shows how work in the potteries may have been organised. This has a bearing on the uniformity of the products, and also on trade: the organisational aspect of an industry relates directly to the scale of production, and thence to the



scale, and methods, of distribution of the products (see discussions in Balfet 1981; Fry and Cox 1974).

Particular ceramic attributes may be workshop-specific, peculiar to an individual potter, or to a batch of pots from one firing (see, for example, Callaghan 1981; Descoendres 1983; Fulford 1975; Impey and Pollard 1985; Keay and Jones 1982; Leach 1976; Loughlin 1979; Mayes and Butler 1983; Megaw and Jones 1983; Rye 1977; Tyers 1978). Conversely, some similar procedures may be followed by more than one workshop (e.g. Arnold 1975, and see Appendix 6). A technological practice (or tradition, if it has some longevity) may be the product of one specific industry, i.e. of one group of potters working together in one place (Arnold 1971, 39). Such an exclusive relationship must be demonstrated, however, from the evidence of the workshops themselves. There is some evidence of pre-Spanish pottery workshops in Peru (e.g. Bawden 1982, 307; Isbell 1984, 117; Rick 1980, 71; Topic 1982, 275), but none from in or near Cusichaca, or in the area around Cuzco. And I know of no work which has made a study of the raw materials, batches of fired pots or wasters from the workshops, with the aim of defining a pottery's products.

"Choice and preparation of materials ... are probably a stronger reflection of tradition and culture than are form and decoration" (Williams 1982, 7). So far, the kind of study I have described leads back to the potters, but the sherds in this collection were found where they were used, not made. One must assume, therefore, either that the potters were working in the same cultural milieu as the

consumers, or that the potters were sensitive to demand, through a feed-back mechanism generated in the 'market place', or that the choice of pots by the consumers was discriminating. Then the connection between technological basis (geared to the shape, appearance and utility of the finished pots), and the distribution of sherds on site (reflecting consumer choice and subsequent use), becomes a logical one.

### C. Classification

The sample was divided into groups called 'wares'. Each ware comprised pottery made according to one technological procedure: i.e. the coarse composition of the fabric, and the methods used to refine and/or combine its raw materials, were the major distinguishing characteristics. I assumed that the character of the fabric and the potting technique would predetermine at least some aspects of the pottery shapes and decoration. So these characteristics were considered subsequently, and used to sub-divide the ware groups only when the extent of the technological control was understood. In this way, the shape and style 'families' referred to above could be seen in terms of the influence of potters upon one another's industries, rather than as independent aesthetic traits somehow floating above actual potting practice.

## CHAPTER 4. Analysis and results

### Part I: The production

#### **A. Fabrics**

##### **A-1. General characteristics**

All of the Cusichaca fabrics (bar Wares 71, 74 and Sample 126) are coarse-grained and crowded with rock fragments ('clasts') or disaggregated minerals ('grains') (Appendix 1-3, plates 2a, 4, 6a, 7, 8a, 10, 11a, 12). Quartz appears consistently, of course; feldspars are common; biotite mica is very common, being absent or rare only in Wares 6, 8, 23, 24, 45 and 69. There are no organic inclusions, no calcite, and grog (crushed potsherd) appears only in Ware 4.

Fully oxidised clay colours vary significantly from pale creamy pink (plates 7, 10) through terracotta to a dark orange-brown (plates 9, 12). Some clays (e.g. Wares 9, 12, 24, 69, S. 400; see plates 4, 11a) are carbonaceous. Fresh fractures vary from rough to laminar.

##### **A-2. Technical characteristics**

In the present context, the difference between fabrics which were made of raw clays used (more or less) as found, and those whose components were artificially combined, is a crucial one: first, because of the different potentials of the two types of fabrics for

identifying source areas, and secondly because of the fundamental difference in potting practice.

I have chosen the following criteria to distinguish between a tempered and an untempered fabric (see Glossary; and Hodges 1964; Peacock 1977; Shepard 1976; Vince 1979):

- a) poor sorting. A tempered fabric will have a category of mineral inclusions in a distinct size range: in particular, a large component (the temper) in a matrix of smaller minerals.
- b) exotic petrology. A tempered fabric may have a category of mineral inclusions different in type from the remainder.
- c) unusual shape and condition of inclusions. A tempered fabric may contain some minerals or rock fragments with sharp edges, and in a fresh condition.

Ideally, then, it should be possible to distinguish temper because it comprises large, freshly-crushed fragments of one (or more than one) rock type (or minerals deriving from it), of a kind not found in the raw clay. But in practice it can be seen (Appendix 3) that immature raw clays deriving from fast-flowing Andean streams also contain distinctive categories of fresh, sharp materials. But, using samples of prepared fabrics from the modern potteries at Raqchi and Chocamarca (see Appendix 6, p.275), the criterion of 'sorting' still holds good, and this is because the clays have been sieved, and often washed, thus removing their own natural largest components, before the temper was added.

This provides a second useful criterion for identifying a potting procedure: a sieved clay can be recognised because it contains no natural inclusions above a certain size, but below that size, the inclusions are unimodal; if the clay were washed, then this upper size limit is significantly low. These two procedures are both easy to identify and distinguish from each other in the modern samples. They have exact equivalents in the archaeological fabrics, and I assume that these derive from the same procedures.

There has been no formal texture analysis (see Appendix 2), but it is clear that the texture of most of the Cusichaca fabrics, represented by the relative proportions of non-plastic inclusions to ball clay and the size distributions of the inclusions, is similar.

1. Tempered: washed clays (tempering material listed)

a). andesite: Wares 13, 15, 26, 27, 74, Sample 126 (plate 6a)

(see Introduction to Appendix 1:1 for terminology)

weathered andesite: Ware 28

vesicular andesite: Sample 176

porphyritic andesite: Ware 29 (variable: see 2, below)

(plate 7).

b). slate: Wares 8 and 23.

2. Tempered: unwashed clays

a) porphyritic andesite: Ware 29 (plate 7).

b) grog: Ware 4

c) altered rock fragments: Ware 73.

3. Untempered: (Major inclusions listed, minor inclusions in brackets.)

- a) trachy-syenites (andesite): Ware 66 (plate 10)
- b) porphyritic andesites (quartz): Ware 11
- c) trachy-syenites: Ware 45 (plate 8a)
- d) granitic, + quartz: Wares 1, 21, 54, Sample 400 (plate 12)
- e) granitic: Ware 4, 9 (plates 2a and 4)
- f) granitic + metasediments: Ware 24
- g) sandstone: Ware 40
- h) weathered granitic (sandstone): Ware 12, 69, Sample 24 (plate 11a).

A-3. *Geological source areas* (see Appendices 2, 3 and 6, and Appendix 7, maps 1 and 7).

It is impossible to tell if the washed clays of the tempered wares were derived from redeposited (secondary) clays, or from primary deposits (clays weathered *in situ* from the parent rock). In all other cases, both tempered and untempered fabrics used clays which resemble redeposited material.

In the Cusichaca valley, numerous different clays have been found, both residual and redeposited. A much more cursory survey in adjacent tributary valleys of the Urubamba, in the Urubamba valley itself, in the valleys above Ollantaytambo, and in the Cuzco area, indicates that clay is far from rare, and that most of it can be used to make pots.

The Cusichaca clays fire across a range of colours, and fracture in a variety of ways, which encompass the range for the clays of the archaeological fabrics. The Ollantaytambo clays tend to fire a pale pink, with a slightly laminar fracture. The samples from Cuzco are too few to draw any conclusions.

The fresh granitic and quartz-rich untempered wares could all have been made from local clays (or, in the case of Wares 17 and 24, from clays south of the Huayllabamba fault), but I have not been able to identify any specific correspondences. Trachy-syenite is not found in local rocks. It appears in rocks and in clays in the Paucacancha valley above Ollantaytambo, but also at Chinchero and in the Cuzco valley.

None of the minerals used for tempering appear in the lower Cusichaca, either as part of the hard rock geology, or as redeposited rock nodules in the glacial moraines. Sandstones and slates appear further up the Cusichaca but, superficially, they do not match the materials used in Wares 8, 23 or 40. Andesites of many kinds are found to the south of the Cuzco valley near Raqchi, and nearer to Cuzco where two Inca period quarries produced the andesite for refurbishing Pachacuti's capital (Protzen 1983; and see below). But, so far, no exclusive relationship has been recognised between any of the tempering materials and a source area; and given the varied and complex geology of the South Central Andes, and the lack of detailed surveys, there is no reason to suppose that similar geological environments may not occur frequently.

There is also no reason to suppose that raw materials might not have been transported some distance from source to workshop. This may apply, for example, to the andesite temper. The wares in which this is found resemble Cuzco Inca pottery in shape and decoration. The Imperial quarrying activities at Rumicolca, and Watanay near Cuzco would have produced quantities of waste and andesite's special properties would have been appreciated (see p.58).

To summarise so far, the tempered wares use clays which can be matched visually with clays from the Cusichaca valley . But none of the tempering materials occur locally. Comparable materials have been found in a few areas, but, given the present state of geological survey in the South Central Andes, it would be unscrupulous to suggest that these are the actual and only sources. The granitic and quartz-rich untempered wares could all have been made from local materials. The fabrics of the other untempered wares have no match in any sample of raw material found in the Cusichaca valley so far.

#### B. Manufacturing methods (see Appendices 1, 3).

All the Cusichaca ceramics were made in a very simple way, similar for all wares bar one (74). Pots were made by coiling ropes of clay (see, e.g. plates 5a, 6a, 11a). Rims were made by adding extra fillets of clay (plate 1b); more rarely, the top coil of the neck was folded over to thicken and form the rim (Appendix 1-3, fig. 7a). Strap handles were made by rolling sausages of clay and butt-welding them (see Glossary p.283) to scored surfaces (plate 2c).



Bases and bodies of most pots were shaped as they were made; a few were carved to shape after drying out, and most rims were shaped in this way (plate 8b). Finishing techniques included wiping, wet-hand finishes, and the application of self-slips (see Glossary). Most slipped, and some unslipped, wares were polished (see Glossary) on visible surfaces (e.g. plate 6b).

There is no sign at all that the specific combinations of minerals comprising the fabrics were significant in the manufacturing processes, but the actual presence of non-plastic inclusions is important to the workability of the fabric, in counteracting shrinkage during drying-out (and in firing, see below), and in speeding up the drying process. And the texture of the fabric, in terms of quantity of inclusions and their particle size, is the critical factor (see, e.g. Rye 1976, 108-9; Shepard 1976, 25-26).

The pots of Vares 1, 8, (11), (12), 15, 23, 24, 28, 31, 45, 50, 54, (55-58), 66 and 69 were made in one continuous process of coiling, usually with the coils joined edge to edge. It follows that pots made in this way tend to have simple or globular shapes (e.g. Forms A, N, M, and plates 1a, 8b, 11b; see Appendix 4 for all form codes); and there is a distinct upper size limit (Balfet 1981a). But in Vares 4, 9, 13, 26, 27 and 29, the shape repertoire includes pots with angular profiles, some very large (Forms B, H and E), and all with relatively thin walls (plates 2b, 6b). Examination showed that each section of each form (delimited by a change in profile) was made by coiling continuously in the usual way, but that the point of

inflexion was not spanned by a continuous coil, but coincided with an overlapped join between two separate coils; often a strip of clay was used like Sellotape to span the join on the inside (fig 3a).

Experiments show that even small examples of Form H do not hold their shape if made in one continuous process (compare Leach 1976, 75); that sharp changes in angle of profile are, in fact, hard to make with a continuous coiling method; and that open, flaring forms, such as Form J, are very difficult to control if they are made all in one go. However, if the pots are made piecemeal, and all the sections allowed to dry out before assembly, then it becomes relatively easy to make even very large pots with complex, angular profiles. This kind of procedure means, too, that the inward curve of a shoulder below a narrow neck, difficult to make in a coiled pot, can be achieved with some precision if the upper body be made upside-down, like a baseless bowl, the mirror-image of the lower body; and all parts of the walls can be thin, thus saving on clay, and keeping the weight of the pots low.

Other features which derive from the manufacturing methods include:

- a) a downward droop in all vertical strap handles: this could not be counteracted because handles were never plugged (see Glossary; and fig. 3a; plate 8b).
- b) the concavity in the flaring wall of the basal section in Form H (fig. 3a; plate 6b). This characteristic undulation occurs naturally at the point where the first coil was added to the

thumb-pot form of the base, and was emphasised by the way this section must have been supported during manufacture.

c) a similar undulation in the walls of Form J, at the point where two major sections were joined (fig. 3c).

d) the diagonal direction of polishing facets in almost all wares. Both vertical and horizontal strokes tend to push coils apart (plates 2b, 6b).

e) the position of handles and head-lug in Form H (fig. 3a). The strap handles span the major join in the lower body. Kaufman-Doig (1978, 540 and 726) illustrates the way these pots were probably carried on the back, and this shows that ropes would have run across the pot walls diagonally. Even with a fully-fired pot, if it is coil-built the horizontal plane will always be the weakest, and this method of arranging the rope would keep the pot under compression.

#### C. Firing (see Appendices 2, 3 and 6).

All of the archaeological fabrics used clays which are earthenwares, and which do not, therefore, require high firing temperatures much in excess of 600° to mature (see, e.g. Nicklin 1981, 352). No high temperature effects, such as vitrification, are visible, and there are no attributes which would have required carefully controlled firing conditions or temperatures in order to work (e.g. reduced surfaces or glazes).

All of the pottery was oxidised, or was obviously intended to be. The black colour of Ware 1 (plates 1a, 1b) derives from use, not from reducing conditions or retention of carbons in the original firing.

Methods of pre-Spanish firing in the high Andes have not been studied before. The method nowadays, if electric kilns are not used, is to use an open bonfire, fuelled with combinations of dung, straw, other vegetation and occasionally wood (compare O'Neale 1976, 44, 47, 55, 57). This method is used to fire the products of small-scale, non-specialist, *ad hoc* potting, and also the very much larger quantities from the specialised, full-time, mass-productions at Raqchi and Chocamarca (up to 150 pots at a time). In both places, the success rate is very high; pots are fully oxidised, and the firing schedules are controlled entirely by a set quantity of fuel. All debris is removed. There is no reason for the moment to suppose that any of the Cusichaca wares were fired using more sophisticated methods.

Fabric composition is important in pyrotechnology. First, it is important that the inclusions remain stable, or at least behave in a predictable way. All of the inclusions identified in the archaeological fabrics are stable up to, and above, the temperatures needed to fire earthenwares (see above), and no fabric was vesicular. Secondly, it is important that a so-called 'clay' has enough clay-grade minerals to become ceramic. With a redeposited clay, even if one performs a 'ball test', the proportion of clay to-silt-grade minerals may, in practice, be too low, and the fired body

commensurately weak, but no such phenomenon has been seen in the archaeological wares.

Texture, again, is important, because mineral inclusions open up the fabric and permit freer circulation of gases (Leach 1976, "opening materials", 275, and 46, 56; Woods 1983/4, 25 and 31). In particular, pottery fired at high altitudes may have needed open, coarse fabrics for successful, rapid firing and/or complete oxidation. Lack of oxygen and low atmospheric pressure begin to be critical in all kinds of ways above 8000' OD (the height of the valley floor at the Cusichaca and Urubamba confluence). Fires burn sulkily, and chemical changes occur at rates or temperatures different from those at sea level. Given the textural coarseness of all of the archaeological fabrics (bar Sample 126 and Ware 74), and the likelihood that some of the pottery may have been fired locally or at higher altitudes nearer to Cuzco, it seemed worthwhile to look for a causal relationship by experimentation.

No such relationship could be isolated, however, but it did become obvious that the coarser the fabric, the more rapidly it fired. It was critical that a temperature of c.600°C be reached but, with fabrics similar in texture to the archaeological ones, this could be achieved very rapidly and needed to be maintained for no longer than 20 minutes or half an hour. There was no obvious benefit in firing to higher temperatures or for longer.



Fuel is at a premium in the high Andes. The open texture of the Cusichaca fabrics relates in part, I think, to the economic desirability of short firings which use the minimum amount of fuel.

## Part II: The products

### D. Shapes (see Appendix 4).

"The form of a pot is determined (although not precisely so) by its intended function" (Renfrew 1977, 3). Thereafter, the shape may be modified in a small way during manufacture by the technological mechanics, by stacking requirements in firing, by the mode of transport to the consumer, and so on. But "the actual shape of a pot has rather little relationship to its purpose" (Ehrlich 1965, 8). There is a difference between 'intended function' and actual 'purpose'; the precision of the equivalence between form and function depends upon the degree of specialised use.

A large number of different shapes in discrete size ranges in an assemblage suggests specialised use: a particular pot had a particular purpose. In the past as now, some pots may not have been 'used' at all, but have been ornamental, or special in the way described by the words 'prestigious' or 'symbolic'. But, archaeological context apart, knowing what a pot was actually used for depends upon either identifying its contents, or by recognising distinctive wear marks, or by logical deduction based on marked peculiarities in shape (e.g. sieves). And of these, only the first is

certain, and then only for the last use of the pot (Hally, 1986, provides an excellent review of the whole subject, but with a more optimistic view than mine).

I shall consider this last point for a selection of shapes, and discuss whether fabric was important in terms of serviceability.

The majority of the pots in the Cusichaca collection are medium to small-sized, open-mouthed pots, usually with handles or lugs, of the kind usually called 'cooking-pots', or 'ollas': Forms A, E, (M); globular pots of various sizes, with long narrow necks and everted rims, and usually with handles ('jars': Forms B, H, (M)); and bowls: shallow, open shapes, with incurving or outward flaring walls, sometimes with handles or lugs on the rims: Forms C, G, J, K, N. Ware by ware, there are small-scale, formal peculiarities, and in some wares there is a relatively large range of distinctive shapes.

In Wares 24, 31, 54 to 58 and 69, the shapes include globular jars (Forms B, M) and bowls with straight, outward flaring walls (Form N). There is a sliding scale in size for both shapes. Carbonised food remains and carbon discolouration from fires are found indiscriminately in and on both plain and painted jars of all sizes, so there was obviously not a separate category of cooking pot. No other kind of use can be identified.

In Wares 9, 11, 13, 15, 26, 27, 28, 29, 45, 50, 66, 71 and 74, all the pottery is painted to some extent, and no food residues or

discolourations have been seen on any of them. Wares 9, 13, 26, 27, 29 and 74 each comprise a number of shapes, the majority of each of the same size. The reverse is true for the other wares in this group, bar Wares 11, 15 and 50, which each comprise too few examples to be sure.

Wares 4, 6, 21, 39 and 73 comprise plain pots or pots with very little and simple decoration. Each ware has only one or two shapes, with little size variation. Food residues and discolourations are absent.

Wares 1, 8, 12 and 23 are also undecorated. Each ware has very few shapes, and their sizes vary little. Carbonised food remains are common in all of them, and smokey discolourations are very common (plates 1a, 1b, 3).

Human bones have been found in ollas in Wares 1, 4 and 9. There is no other independent evidence for the use, or last use, to which any pot was put.

It is only 'cooking-pots', then, which can be identified as a functional category, and then only when the pots actually contain burnt food remains.

The body of a cooking pot, intended to sit directly on, or near, an open fire, must be refractory. This is normally achieved by using a coarse fabric with inclusions which are stable, and/or have a low



coefficient of expansion. Potentially, all of the Cusichaca fabrics would perform in a suitably refractory manner (see discussion in Woods 1983-4). However, I suggest that in Wares 1, 8 and 23, the only three specialised cooking-pot wares, the effective coarseness was increased by making the walls of body and base extremely thin (figs. 1a, 6a; plate 1b). Ware 4 has this characteristic too (fig. 2), although these pots are never found in Cusichaca containing food residues or with surface discolourations. The fabrics of all four wares contain a majority of rock fragments, rather than individual mineral grains (e.g. plates 1b, 2a); Rye (1976, 118) mentions that rocks have lower coefficients of expansion than each of their component minerals. But many other wares in the repertoire, including fine wares, share this characteristic (compare plates 7, 8a, and 12), so it is hard to prove that it was a deliberate policy to improve serviceability.

#### E. Decoration (see Appendices 2 and 5)

The painted decoration of the Cusichaca wares is based on black, red and white paint, applied before firing to slipped or unslipped, polished or unpolished surfaces. Some pigments dried with a natural gloss; others were polished. Most of the designs are repetitive, linear and geometric. Major design construction lines are vertical or diagonal, at least on bodies. The sole exception is Ware 15, where designs on the body are arranged four-square. There are rare examples of cursive, undulating bands, arranged vertically or diagonally, and

very rare examples of disjointed motifs covering an entire surface (e.g. Ware 71).

In some wares, paint sub-divides the shape categories: Forms B, C, G, H, K, N and M all have painted and plain facies. The more clearly defined the different parts of the pot, the more likely the design to reflect the changes in angle (e.g. Kaufmann-Doig 1978, 540). In some cases, this may be simple mechanical convenience. Conversely, on globular pots (e.g. Form M), with ill-defined 'fields', the design lay-out is similarly amorphous (fig. 7a; plate 8b).

However, there is a consistent relationship between scale of design, pigment texture, and surface flatness and texture. This means that the more uneven and rough the surface, the larger motif, the wider the brush-strokes, and the thinner the paint (e.g. plate 9). Smoothness of surface texture was partly the product of effort, but it was easier to achieve in fabrics which contained homogeneous minerals or clasts with flat surfaces: in polishing, these surfaces could be aligned with the surface of the pot. Grainy, crumbly, heterogeneous rock fragments presented some problems. But if all else failed, and if surface smoothness was important, then a slip was added. Wares 13, 26, 27, 29 and 66 have particularly smooth surfaces (plates 6a, 6b, 7). On these wares, paint was thickly applied with thin brush-strokes, in small motifs. Even if there was a large area to be painted, the designs were not scaled up, but simply repeated

more often. The reverse is true of Wares 45, 54 and, to some extent, Ware 9.

Pigment colour is the product, first, of the relative proportions of iron (purples and reds) and manganese (black), or the effective absence of both (white). For blacks and reds, the analysed samples show that the relative proportions of iron and manganese vary only very slightly, and in all wares these pigments sometimes change colour across a body (e.g. plate 9). The actual form of the pigments and the medium used to spread them, has not been determined yet.

Thereafter, the behaviour of the pigment minerals and the resulting colours may have been controlled or affected by:

- 1) particle size. In all wares where a sample could be removed (Wares 13, 26, 29), black pigment comprised much smaller particles than red. This may have made it denser, and perhaps less apt to oxidise (Tite, Bimson and Freestone 1982, 123-4). A sticky texture on the surface of some blacks suggests that a sealer may have been used too.
- 2) local reactions with the clay minerals of the body. This is especially noticeable when paint was applied to an unpolished surface. In Wares 54 and 69, where the paint often seems to be no more than a patterned discolouration of the body (e.g. plate 11b), a variety of unsystematic and subtle colour changes can be seen.
- 3) polishing the pigment after application. In some cases, this seems to have inhibited oxidation, producing variations on the

purple and red themes. The rare grey pigment on Ware 24 was always thoroughly polished: although I do not know the pigment's composition, the polishing may have prevented oxidation or volatilisation of its components. Polishing also alters the refractive index of the paint, so that the perceived colour of a polished pigment is different from that of its unpolished twin.

4) overlay of one pigment by another. Chemical reactions apart, this obviously affects clearness of colours.

5) colour of the underlying body. There is every indication that a light body colour was preferred; and the more detailed the painting, the more obvious this preference becomes. However, it was controlled where necessary by using a pale slip, if the body colour naturally fired too sombre a hue. (Sometimes the actual quantity of paint could have a deleterious effect. Ware 13 often has a dusky hue, the product of a body incompletely oxidised beneath layers of paint and polish).

There is one other point to make. In Wares 13, 26 and 71 (and more randomly in others), surfaces twinkle with biotite mica. This is sufficiently common and striking enough to suggest that mica was added for deliberate aesthetic effect. In the very rare cases where mica is confined to a slip, its presence is probably the result of preparing the slips by floating them from a naturally micaceous clay, enhancing the mica content in the skim. In all other cases, it can be seen that the micaceous twinkle results from the polishing of the pot's surface, and the consequent flattening of the mica grains so that they present their shiny surfaces to the eye. There is no higher

concentration of mica grains on the surface than in the body, and no higher concentration of mica in these fabrics than in those used to make 'non-twinkling' pots. So in these cases, the control is exercised through the extent of polishing. This is not to say that micaceous clays were not chosen deliberately, but only that there is no sign that mica was added by the potters.

### Part III: Conclusions

The pottery from Cusichaca was made from both untempered and tempered fabrics.

Many of the clays used could have been taken from local riverine deposits. For some wares, naturally micaceous clays seem to have been preferred, as were clays which fired a pale colour, but these characteristics are common in clays from all over the place. Good potting clays seem to be ubiquitous in the Andes, and their location, therefore, is unlikely to have determined the location of workshops. Fuel for firing and access to water may have been more critical (see discussions in Nicklin 1981; O'Brien 1981; and compare Rye and Evans 1976, 126-7; van der Leeuw 1984, 59).

None of the mineral temper could have been derived from rocks in the immediate vicinity of Cusichaca, but there are several potential sources for each type further afield.

Non-plastic inclusions in a clay body are essential for several reasons (see p.45ff) and temper will be added if a clay naturally does not have enough, or if its natural inclusions are the wrong size or shape, would perform unreliably during firing, or would weaken the body during use. But we can see that for all wares bar two (see below), the actual petrological identity of the inclusions conferred no systematic benefit in the manufacture, firing, or subsequent serviceability of the pots (contrast Beynon *et al.* 1986, 300; Bronitsky and Hamer 1986, 90).

The different andesites used to temper Wares 13 and 29 are indistinguishable by eye and, in turn, difficult to distinguish from the trachy-syenites in Wares 45 and 66 (compare plates 6a and 7 with plates 8a and 10). I shall discuss these, and other visual similarities in fabrics in Chapter 6, within a chronological framework. I suggest here that they are not simply coincidental, but arise from some consistency in the technological traditions.

In two cases, the specific characteristics of the inclusions seem to have been important. It is a general pre-requisite of inclusions that they form a strong bond with the clay, and this is achieved when the inclusions have an angular shape and are sharp edged. Shepard (1976, 27, 130-36) specifies andesite and grog as two of the most suitable materials. Andesite, in particular, has beneficial properties, as it is extremely hard and homogeneous (Ixer and Lunt forthcoming). I shall consider here Wares 13, 26 and 27, for which

fresh andesite rock was used as temper; and Ware 4, which was tempered with grog from sherds of Ware 13.

These wares comprise pots which match the specifications given by Rowe (1944) for Cuzco Inca pottery. There is no geological proof of where these pots were made, nor whether they were made in more than one place. But on balance, I think it is likely that Wares 13, 26 and 27 were made in the Cuzco area, where andesite outcrops and was used extensively in the pre-Hispanic period, where a precursor for the decorative style has been recognised, and where, together with Ware 4, they form the major components of Late Horizon Period assemblages. Certain forms in these wares are identified consistently and frequently as 'Cuzco Inca imports' in collections from all over the Inca Empire, and their stylistic influence can be detected on traditional, provincial pottery (see Chapter 1). It seems likely, therefore, that these wares were traded beyond their area(s) of origin, and sometimes over great distances; in which case, the benefits of strength combined with lightness are obvious.

Each shape in Wares 1, 4, 6, 8, 9, 13, 21, 23, 26, 27, 29, 39, 73, 74 (and in Samples 126 and 176) is represented by pots which are extremely uniform in profile, in wall thickness, and in size. Even rim profiles, which usually show much variation in hand-built pots, are very similar per shape and per ware. In these wares, although there are a number of distinctive shapes, many of the shapes are hybrids, having similar rims, parts of bodies, handles, and so on, as

if there were a limited repertoire for each part of a pot. The pots of Wares 4, 9, 13, (21), 26, 27 and 29 were made piecemeal, which allowed an easier and more exact control of the shape, and the formation of angular, large shapes.

And, for these wares, there is a comparable uniformity in the painted decoration. The motifs, their colour and size, have been chosen from a limited repertoire and their configurations relate to the shapes of the pots in a most predictable way.

Balfet (1981), amongst others, uses uniformity in formal details and the production of a limited number of distinctive, standardised shapes, to distinguish the products of full-time, specialist potters from those of *ad hoc*, casual, or even seasonal potting. Ethnographic observations such as these are important for the archaeological material, because of the implications for scale of production and marketing. In Raqchi nowadays, potters work on a semi-seasonal basis, but they consider themselves to be potters, not farmers. They make their pots piecemeal, and each potter organises his work along a production line, where as many as twenty pots are worked on at once; there is no waste of time as the segments dry out (see plate 3). It seems plausible that the pottery of Wares 4, 9, 13, (21), 26, 27 and 29 was produced in a similar way. This is not to say that no other wares were 'mass-produced' by 'full-time' specialists, but only that these kinds of evidence are lacking for them (see discussion of standardisation and mass-production in Welbourn 1985).



This is as far as it is possible to go for the moment in the characterisation of the pottery. To discuss the chronological spread of each ware, and the original or secondary purposes of the assemblages, requires knowing all of the contemporary associations and the identities and relative dates of the contextual soils. More speculative topics, such as influence of one ware upon another, developments in style and technology, the relationship between, for example, economic and Inca Imperial strategies, can be discussed *in vacuo*. But, in this case, they will be grounded in the archaeological evidence of superposition and association.

## CHAPTER 5. Archaeology

Introduction: scope and organisation of Chapters 5 and 6 (see Appendix 7, map 1)

Cusichaca is near enough to Cuzco for comparisons with the Inca capital to have some meaning. But there is some interest, too, and possibly some advantages, in studying an area which was, in Imperial terms, provincial, and which Kendall (1985, Part III and 344ff) thinks was occupied relatively late in the Imperial period. The Inca occupation in the valley can be recognised easily because the architecture of the buildings approximates in many detailed ways to the "canons of Imperial Inca architecture" defined by Kendall (*ibid.*, 5 and 9ff). The Inca presence is divided up between six sites in the lower Cusichaca, all within sight of one another, but distributed across a variety of environments. Kendall considers that each site had a particular purpose (*ibid.*, 188ff and 224-241), and that they were all intended to be, and were, occupied simultaneously, and continuously, to the end of the local Inca period (Kendall 1984, 249; 1985, 186). They all have stratified deposits associated with the Inca buildings. One site, Q2-1, has a sequence of soils which pre-date the Inca occupation.

The chronological succession of the pottery wares, and their distributions within each site and across the valley, can be demonstrated quite simply. But any discussion will depend absolutely

on the interpretation of the archaeological deposits, in terms of their derivation.

In Chapter 5, Section A, each site is described and discussed in turn. In Section B, I consider the lower Cusichaca as a whole, and present two relative chronological schemes. In C, I discuss the relationship between the archaeological deposits and the artefacts in general terms, assessing the potential for observing chronological and spatial behaviour of pottery from the Cusichaca deposits.

In Chapter 6, I return to the pottery itself, placing the wares in their chronological framework, and then discussing their spatial distributions during the Inca period.

#### A. Excavation results

The standing structures on each site have been described in detail by Kendall (1976; 1985), and I shall use her nomenclature throughout for the sites, buildings, and open areas. I shall concentrate only on those sites which are situated in the lower Cusichaca valley and in the immediately adjacent uplands, and which have been extensively excavated. I shall refer to Q1, Q1B, Q4-1, Q10 and parts of Q2-1 as the 'Inca sites'; they all have standing masonry of Inca type, and associated deposits. Conversely, the Q1 tableland, parts of Q2-1, Q2-2, Q3, Q4-2 and Q5 will be called the 'non-Inca sites'. For a general description of the lower Cusichaca, and the adjacent Urubamba (Quente) area, see Kendall 1985, 186 and 290-1. For INCA 1A to INCA 4 (Arabic numerals), see Chart 1, p.64.

CHART 1. Sequence of events on each Inca site in the lower Cusichaca.

[Pre-Inca: Q2-1 only]

Inca 1: building activities:

Inca IA: landscaping of the sites and environs:  
levelling, terracing

Inca IB: construction of the buildings up to and  
including laying the floors; also construction  
features in levelling soils sealed by the  
floor surfaces.

Inca 2: features on, or cut into, Inca 1B soils, and deriving from  
the first phase of occupation of the sites; sealed by  
Inca 3 soils.

Inca 3: soils overlying Inca 1B floors or Inca 2 features, up to  
and including higher floor surfaces; also later structural  
activities associated with these soils.

Inca 4: features contemporary with the occupation of the sites  
after Inca 3 activities; also any features which, for  
other reasons, obviously belong to a late phase in the  
Inca occupation.

NOTE: Where strata cannot be distinguished, features deriving from  
the whole Inca occupation are called Inca 2/4. This applies, too, to  
undisturbed soils overlying terraces in areas between buildings.  
Soils overlying floor surfaces are always referred to as Inca 3, or  
Inca 3/Post-Inca if the distinctions are difficult because of later  
disturbance.

Q2-1: non-Inca and Inca sites (Kendall 1985, 187 and 294-9)

A high promontory overlooks the lower Cusichaca and the confluence of the Cusichaca and Urubamba rivers. Behind lies a tableland, covered in masonry and rubble (Q2-2: Kendall 1985, 293 and 300-307; see below, p.115) and traversed by canals. In front and to either side, the promontory sheers down to the valley floor.

The 'non-Inca' occupation can be identified as 'pre-Inca' because the evidence underlies the Inca buildings or levelling deposits. The evidence includes the bottoms of features cut into bedrock, or basal deposits preserved in natural gullies; burials; the lowest courses of the walls of rectangular, oval and round buildings; pits and post-holes; and spreads of soil. A recent review of this evidence (Hey 1984) has suggested that the promontory was not occupied intensively before the Incas; instead, there was a succession of different, sporadic activities. In a few areas, their traces are stratified. The condition, size and quantity of artefacts in these pre-Inca soils varies: typically, most are small and abraded, and it is rare to find sherds from the same pots.

**INCA 1A**

Inca occupation began with a massive landscaping project. A series of large, level terraces with revetment walls was stepped down from the back of the promontory; this involved cutting down into earlier soils and/or bedrock at the back of each terrace, and building up at the front with soil and rubble. The levelling deposits are coarse-textured, containing rubble, some bone and quantities of

pottery. The condition and size of the sherds vary. Their orientation in the soils is random. Very rarely, sherds from the same pots are found in similar soils on different parts of the site.

Subsequently, the terraces were built upon or left as open areas. There is no sign that there was a pause before building began, that building was sequential, or that it was spread over a long period of time.

## BUILDINGS

### INCA 1B

The first activity in each building varied according to the material beneath. If bedrock was exposed, there was no foundation trench, and the walls were founded directly on the rock. If the building plot were covered in levelling deposits or pre-Inca soils, the walls were bedded in. Where the fills of the bedding trenches can be distinguished, they are similar in texture and content to the levelling deposits.

The walls were built using stone and adobé. Small potsherds and fragments of bone were incorporated.

The inside of each building was now filled, first with soils containing small rubble, and then with finer-textured soil. Both fills contain potsherds, fragments of bone and stone objects. Post- and stake-holes and other small features are sometimes found in these soils, and probably derive from the construction activities. Mud

mortar was used to make a compacted floor on the tops of the levelling deposits, and to render the walls.

#### INCA 2

In some buildings, there are small features cut through the floor surface and sealed by the soils above. Occasionally, these contain the lower parts of pots, truncated at floor level. A few sherds and bones may be embedded flat in the surviving fragments of flooring.

#### INCA 3

In all buildings, a series of deposits overlies the original floor, sometimes incorporating fragments of higher surfaces or related to more substantial refurbishments such as partition walls. Potsherds lie higgledy-piggledy in these soils, varying in size and condition, fewer in quantity than in the Inca 1A/B deposits. It is unusual to find sherds from the same pot adjacent to one another, but they can be found sometimes in similar soils in different buildings. Occasionally, fragments from pots whose bases were embedded in the first floor occur in the overlying soil.

#### INCA 3/INCA 4/POST-INCA

Uppermost soils contain large rubble, adobe debris, potsherds and bone. The sherds are in two categories: immediately under the rubble and vegetation large fresh sherds lie flat; and small, abraded and discoloured sherds occur all through the debris (see below).

#### POST-INCA

Vegetation has colonised extensively, and true soils have begun to develop.

There is no sign of post-Inca habitation. Ploughing can be recognised because the ploughshare has chopped the sherds into tiny angular fragments.

#### OPEN AREAS

The Inca 1 terrace soils are overlain by shallow deposits, which have often been ploughed.

Kendall considers (1976; 1985) that the site was intended for a fortress, and that it was inhabited by three groups, all *mitimaes* in army service (see Appendix 7, map 2).

#### Discussion

##### PRE-INCA

The extent and preservation of the pre-Inca deposits vary according to the activities of the Inca builders. Their site lay-out and construction methods determine what, and how much, can be seen of the earlier occupation. It is clear that pre-Inca soils and structures were truncated by the Incas; but, obviously, it is impossible to tell by how much. Therefore, with one exception (see Section B-1) it is impossible to identify with certainty the latest pre-Inca occupation on the promontory; or to say that any kind of occupation immediately pre-dated the Incas.



It seems clear that, within each excavated area, the pre-Inca activities were continuous; no sterile deposits intervene. But, on archaeological grounds alone, it is not possible to link the individual sequences together, nor to account for the derivation of many of the soils.

## BUILDINGS

### INCA 1A/1B

The terrace soils, the fills inside the buildings, and the adobe used in the wall constructions, all contain pottery. The quantity of pottery exceeds what one might expect from the builders' own refuse, and most of the sherds are not fresh (compare Q1, Inca 1A). It seems more logical that pre-Inca occupation soils and their contents were used in the construction - so the pot, like the rubble and gravel, was redeposited, and was present as 'hard-core'.

### INCA 2

I think that pottery in features cut through the floor surface, and sherds embedded flat in the top of the floor are *in situ*, and derive from pots used in or near the building. They are sealed in place by the Inca 3 soils.

### INCA 3

The Inca 3 soils mark a difference in activity of some kind. If they are 'occupation deposits', then it is difficult to account for the difference in position and orientation between the Inca 2 pottery (see above) and that from the Inca 3 soils. A floor was constructed

at the outset: therefore a firm, cleanish surface was, presumably, preferred. It seems to be intrinsically unlikely that occupation of the buildings proceeded amongst accumulating dust and rubbish, and the evidence suggests otherwise.

The sloping contours of the remnants of the Inca 1B floors round the edges of the walls, and floor fragments slumped into hollows in the centre of some buildings, suggest that human (or animal) activity degraded the original surfaces. In modern households in Cusichaca, a shallow, trodden trough is created by the weight of the occupants and vigorous sweepings-out.

Therefore, I suggest that when the Inca-period living surface became inconveniently uneven, the movables were shifted outside, and a quantity of soil was shovelled in to level up. Bits of broken pot left behind in the building became incorporated. The rest of the Inca 3 pot and bone was redeposited along with its soil, which could have been refuse, topsoil, or mined (as Inca 1). Further subsidence is suggested by fragments of more than one upper surface in some buildings.

Sherds from the pots lying in or on the Inca 1B floor can usually be recognised, but no artefact from the Inca 3 soils can be treated as if it were *in situ*.

Drawbacks to this interpretation include the lack of extensive upper floors: there are only small, compacted patches. Similar

levelling-up activities do not occur in the modern local houses: the occupants seem oblivious to the inconvenience of stumbling about on an uneven, poorly-lit floor, although there is some refurbishment every four years or so.

The interpretation proposes a sequence of events which include downgrading into the Inca 1B floor make-up, thus destroying the surface which separated it from the Inca 3 deposit. Where patches of floor survive, it is clear that the profile of the trodden-down surface immediately before levelling-up varied from building to building. And the Inca 1B and Inca 3 soils are similar in texture and colour, albeit separated by a critical period of time.

#### INCA 3/INCA 4/POST-INCA

Nearer the surface, the final activities in the Inca period are obscure. After the buildings were abandoned, roofs fell in, walls collapsed, the adobé decomposed, and vegetation colonised. Some of these events continue to the present, building up soils which are rubbly and full of roots. The effects have also worked their way down. Large rubble has bedded itself in, rooting goes deep, and soil development obscures distinctions in the latest anthropogenic strata. Where the post-occupation soils can be distinguished, they vary in depth, and there is no discernible final occupation surface beneath. Usually, topsoil grades down into the Inca 3 soils. The small, discoloured potsherds derive from the adobé decomposition. Although the orientation of the largest, freshest sherds suggests that they

lie on or near a surface [Inca 4], the contextual soils show no corroborative alteration.

#### OPEN AREAS

The deposits overlying the terrace make-up soils are not sealed, and have been disturbed by ploughing and vegetation. The traces of both may extend down into the levelling deposits, or into the pre-Inca soils. Burials and building remains, alien in style to the Inca structures and not located with reference to the Inca lay-out of the site, are usually the first certain indications that a pre-Inca level has been reached. Because of Inca 1A activities, however, it is not wise to assume that all soils and features immediately underlying Inca 1A soils are contemporary with one another (see above, p.68).

#### Q1: the Inca site (Kendall 1985, 186, 199, 292)

The site is distributed across a series of man-made terraces on a low bluff. It faces Q2-1, on the opposite side of the Cusichaca, and at a lower altitude. Behind the town, a mountain rises steeply. On the upstream side, just below the Cusichaca gorge, the bluff narrows and the slopes become treacherous (Q1 - canal site). On the downstream side, the bluff flattens out into a small tableland (Q1 - tableland site). Below the site, the short, steep slope is terraced down to the valley floor.

Some of the caves which riddle the face of the mountain may have been used in the pre-Inca periods. There is also evidence for pre-

Inca activity on or near the tableland (see Q1: the tableland). But there is no trace of occupation underlying all of the Inca buildings on the main site; and most of the differences between Q2-1 and Q1 in the sequences of soil deposition and in artefact content of the Inca 1A construction soils, can be attributed to the fact that Q1 was built on virgin land. (Note: excavation in 1985 revealed a pre-Inca wall below Inca terracing in the west part of the site).

#### INCA 1A

The area was first landscaped by terracing, using coarse, stony soils which contain no artefacts. The soils were probably brought from nearby, but there was no pre-Inca overburden to mine. The soils are of different grades of redeposited natural, the coarsest at the base.

#### BUILDINGS

##### INCA 1B

The walls of buildings were founded in trenches cut through the terrace soils, or based on levelled bedrock. A finer textured deposit of gravel and sand was then laid, sealing trench fills and butting against the walls. Artefacts in these soils are rare.

Inside some buildings, features were cut into the top of the finer soil, and were sealed by the floor. They include pits and hollows, some containing burials, pots, and other items.

As at Q2-1, the floors and the wall rendering was made of compacted mud mortar.

#### INCA 2/4

Features were cut through the Inca 1B floors; these include small pits in the corners of rooms, some containing pots. These are more complete than their counterparts in Q2-1, and sometimes they contain human bones. But per building, these activities were isolated, and their traces are not stratified relative to one another. The lack of Inca 3 soils (see below) means that it is difficult to attribute these features to a particular phase of occupation.

#### INCA 3

The Inca 1B levelling soils in the buildings are stony and overlie rock, and there seems to have been little subsidence during occupation. Floors were patched in an *ad hoc* fashion; successive small patches of compacted mud mortar, separated by little or no soil, can be recognised. New or rebuilt partition walls sit directly on Inca 1B floors, and can be distinguished only because their building style is different from that of the main walls (cruder, on the whole), because their coursing changes, or because the upper courses contain small artefacts as hard core.

#### INCA 3/POST-INCA

Soils overlie the floors. They grade upwards, becoming darker, more humic, full of roots and incorporating more and more destruction debris and modern artefacts. Lenses of soil from the upper spits

separate original thresholds from doorway blockings, and are incorporated in very crudely rebuilt partition walls. But no visual stratigraphic distinctions can be seen; if the soils derive in their lower part from the levelling-up activities as at Q2-1, then the distinction between these Inca deposits and post-occupation soils cannot be made now. Soil development on this site is extremely rapid, and pedological change goes deep.

Overall, there are few artefacts. Contents of pits in the Inca 1B soils, and in the features cut through the Inca 1B floors, are certainly *in situ*. Very few sherds or bone lie on floor surfaces. Small artefacts in walls are redeposited. The orientation of artefacts in the Inca 3/post-Inca soils is random and, as in the Q2-1 Inca 3 deposits, none of the artefacts should be treated as if it were *in situ*. In the topsoil, sherds from the same pots are often found in the same building or in adjacent buildings and areas.

#### OPEN AREAS

##### INCA 1B

In the open areas, the foundation trenches of the walls of the surrounding buildings can be seen easily because of the inward slant of the walls. A finer-textured soil overlies the terrace make-up, as inside the buildings. Above, a shallow, stony silt grades upwards into modern topsoil. Patches of mud mortar lie against the walls, on the surface of the fine levelling soil, tailing off through the overburden. Artefacts are rare on the surface (tourists, etc.), but

occur in the lower humic silt in great quantities, often in an abraded condition.

The profile of the mud-mortar wash from the walls is important in interpretation. Its accumulation on the top of the finer levelling soil suggests a pause in deposition. This pause may correspond to the entire period of the Inca occupation. On the other hand, in modern buildings, adobe weathers most quickly at first when the rendering is thickest, so that the pause marked by the accumulation at Q1 may have been no more than a rainy season long. Thereafter, the rate of decomposition slowed down dramatically, as debris accumulated during the occupation. If this is the case, it is not now possible to distinguish the Inca accumulation from the post-Inca soils (see Q2-1 above).

Either way, pottery lying on the top of the finer levelling soils may be *in situ*, although some may derive from sweepings from houses rather than from activities carried on in the open air. The large quantity of pottery in the lowest spits of the humic silt may also be *in situ*, but lacking stratigraphic control, I think it dangerous to assume the same of the more scattered artefacts in the upper spits.

Kendall (*ibid.*) thinks that Q1 was built as a town, and functioned as a local administrative centre. She considers it to be the only Inca site in the valley of sufficient size to have housed different kinds of communities (see Appendix 7, map 3).



Q1: the canal burials

INCA 1

To the south of Q1, near the gorge point, a slab-built canal channel enters the site. It dates from the Inca occupation and served at least some of the town's needs. No other water supply for Q1 has been found. Lying directly in the channel, or in shallow pits cut through it, are a number of human burials, a few with deposits of pottery. The archaeological evidence suggests that the canal was still open, and in a good state of repair, when the interments were made. The slopes above are such that falling rock and scree would have accumulated in the channel rapidly if it were not constantly maintained; but both burials and the undisturbed stretches of channel were sealed with the same rubbly deposit. This suggests that the graves were dug and filled very soon after the abandonment of the canal (Inca 4/Post-Inca) (Appendix 7, map 3).

Q1: tableland (Kendall 1985, 271)

At the other end of the site, at the front of the tableland, is a low mound of soil containing numerous tip lines. It seals an old ground surface. The slopes immediately below are terraced, and these terraces continue without break into the Inca terracing system below Q1. The position and composition of the mound suggest that it was upcast from the terrace constructions, immediately pre-dating the occupation of Q1 (i.e. Inca 1A).

The mound contains a quantity of redeposited pottery, but no occupation site has been found on the tableland, and the buried ground surface was sterile of artefacts (see Appendix 7, map 3).

Q1R: the Inca site (Kendall 1985, 187)

On the terraced valley floor below Q1, a huge rock overhangs the Cusichaca. It is incorporated into an Inca revetment wall, which is built against a natural river terrace, and it supports part of a small site, the masonry wonderfully bonded to its contours.

Four periods can be identified on the site:

PRE-INCA

An old ground surface, with a well-developed top- and sub-soil, is preserved beneath another large rock in the main open area. One sherd of pottery was embedded in the surface.

INCA 1A/1B

The land was prepared (including manoeuvrement of rocks) and the buildings were constructed (see Q1).

INCA 3/4

In the one building fully excavated, a second higher floor was made, separated from the first by a shallow levelling deposit.

#### POST-INCA

Glazed majolica pottery of post-conquest type (see Appendix 1-1, Ware 74) was found in numerous pits cut into the earlier layers, and occurred throughout the deep, humic topsoil. Both pits and topsoil also contain building debris.

The Inca 1A/B soils are sterile. The Inca 3 deposit contains very few artefacts. No features were sealed by the floors or cut into them. As at Q2-1 and Q1, it is impossible to distinguish between the latest Inca deposits and the post-Inca soils. Inevitably, most artefacts come from the uppermost spits.

However, Q1E has one great advantage: it is a small site, and there are no others of any kind nearby. Although not necessarily *in situ*, the artefacts must, logically, have been in use on this site.

Kendall (*ibid.*) considers that the site was a shrine complex, serving a regional, specialised élite (see Appendix 7, map 4).

#### Q4-1: the Inca site (Kendall 1985, 187)

Behind the sloping tableland of Q2, an isolated, rounded mountain rises up. On its summit, the land flattens out, and there are separate areas of Inca (Q4-1) and non-Inca (Q4-2) structures.

#### INCA 1A/B

The Inca site was built directly on the levelled bedrock, and the construction methods seem to resemble those at Q1.

#### INCA 1/?3

But no floor surfaces could be distinguished inside the excavated buildings. The deposits can be divided into two components in a rough and ready way according to presence or absence of pottery, of which there is very little. The lowermost deposits, presumably the Inca levelling soils, contain none at all.

The site lay-out resembles that of one of the compounds at Q1. Kendall (*ibid.*) considers that this site had an agricultural purpose (see Appendix 7, map 5).

#### Q10: the Inca site (Kendall 1985, 188)

Below the rapids and the confluence with the Cusichaca, the Urubamba runs straight for a few thousand yards before swinging round to the right, and out of sight. The valley floor here is wide and flat. On the left-hand side, the mountains behind form a wall of rock veined with quebradas. Their lower slopes rise up more gently and then level out into high bluffs; on one of these, above the bend in the river and facing east, is the site of Q10.

There is no pre-Inca occupation on the site.

#### INCA 1A

The small group of buildings sit on level, man-made terraces.

#### INCA 1B

The walls were founded on rock, the first levelling soils were of redeposited natural, and the floor surfaces, internal platforms, and walls were covered in mud mortar. No features were found under or in the floors, and there were no embedded artefacts.

#### INCA 3/POST-INCA

Overlying the floors are shallow, complicated deposits containing some building debris, burnt wood, and a little pottery. These soils probably derive from casual, post-Inca occupation of the site.

As at Q1B and Q4-1, all of the pottery must derive from wares originally in use on the site. It is Kendall's opinion (*ibid.*) that the site was part of the Cusichaca Inca complex, rounding it off, as it were, with a flourish. She thinks that it was a shrine complex, but more important, and with wider responsibilities, than Q1B (see Appendix 7, map 6).

#### The non-Inca sites

The surface remains on Q2-2, Q3, Q4-2 and Q5 are sites in the lower Cusichaca area which lack classical Inca architecture. They are within sight of one another, and of most of the Inca sites. They all

have structural remains, and associated stratified soils (Kendall 1976; 1985, 308ff; see Appendix 7, map 1).

Preservation of the buildings is generally poor and, in any case, the architecture is of a very simple kind. No Inca structures, canals or terraces link the sites together, or to any of the Inca sites described above. Therefore, there is no category of evidence, other than the artefacts, which can be used to date these sites, and they cannot be used in the primary chronological scheme.

## B. Chronology

Some of the major problems here have been discussed above with reference to Q2-1. What follows is a 'best fit' and, to this end, some generalisations have had to be made. For the pre-Inca period, there is no evidence as yet that the sequence is applicable anywhere but on Q2-1.

### B-1. Pre-Inca relative chronology

The pre-Inca remains on Q2-1 are stratified beneath Inca IA soils, or are truncated by Inca levelling. In only one part of the site has the pre-Inca sequence been excavated extensively: below B20 and B17 and in A22 (see Appendix 7, map 2).

The evidence suggests that in this area Inca occupation followed pre-Inca without a detectable pause. There is no sterile deposit or old ground surface sealed beneath the Inca IA soils at the front of

the terrace in A22. Furthermore, the latest pre-Inca structure in A22 was still standing at the beginning of the Inca occupation, because its walls were pushed over to form hard core within the Inca IA deposit. Below, in the pre-Inca soils, there is no indication of a break in occupation, although the successive activities seem to have changed. All the types of pre-Inca feature found elsewhere on the site in isolation, appear here: buildings, terraces and terrace walls, pits, post-holes and burials.

This sequence (described in Chapter 6 and in Chart 2), will be used in Chapter 6 to observe associations, the first appearances, and the longevity of some of the pottery wares.

B-2. Inca relative chronology (see Chart 1, p. 64 and Chart 2, p.86)

On each site, from the levelling of the first terrace to the moment when the first floors were laid and stamped down, architecture and archaeology suggest a continuous building programme following one overall plan, using the same techniques in the same way. There were differences only according to local subsoil conditions, and in the selection of the appropriate architectural details for each group of buildings. Therefore, within each site, all Inca IA and IB deposits and features must be contemporary.

The same argument can be extended to the whole valley. Kendall suggests on architectural grounds that all the sites were built by the Incas as part of one comprehensive scheme, and that they were intended to be, and were, occupied simultaneously (Kendall, 1984,

249; 1985, 186 and 350). She thinks that Q2-1, Q1 and Q4-1 were built first, followed by Q1E and ending with Q10 but, even if the building were sequential, the building process was continuous, and was spread over a relatively short time. The maximum spread, based on architectural features which Kendall considers to be chronologically significant, places the building of Q2-1, Q1 and Q4-1 in the reign of Pachacuti (1438-1471), Q1E in the reign of Topac Inca (1471-1493) and Q10 perhaps as late as the reign of Huayna Capac (1493-1525) (*ibid.*; and see chronological discussion in Kendall 1985, Part III). But only radiocarbon dates have the potential for assigning a provincial site to a specific Imperial reign, and I doubt whether even they could make such fine chronological distinctions.

But in terms of the overall structural organisation of the valley by the Incas, a far shorter building period is indicated. For example, Q1 and Q1E are linked by a road, integral to both sites (Kendall 1985, 187; see Appendix 7, map 3). The sites are connected by irrigation and terracing works which are part of the overall landscaping of the lower valley and surrounding uplands. In some cases, as on the Q2 tableland, earlier terraces may have been remodelled and included in the Inca scheme. The archaeology does not show that the sites were then built at different times, but that construction followed on directly, to be followed, in turn, and without pause, by habitation, and this means that all the deposits and features of Inca 1 belong to the same period throughout the valley (INCA I). Therefore, the same must apply to Inca 2 (INCA II).



Inca 3 deposits and features are localised, and were not necessarily contemporary with one another. However, they all seem to have taken place after a period of time had elapsed, and not to have been personal modifications made at the beginning of occupation. Kendall thinks that the total Inca occupation in Cusichaca lasted no more than 80 years (1984, 265). To make chronological distinctions within the latter part of this timespan seems to me unduly luxurious, and I think it is reasonable to consider Inca 3 as generally synchronous throughout the valley (INCA III). Nonetheless, where Inca 4 activities can be distinguished, this will be significant not only because they belong to a late phase of occupation, but because in a few cases they may indicate a change in activity. Usually Inca 3 or 4 deposits and features are sealed by rubble. Sometimes, it can be seen that they have been disturbed and altered. Post-Inca activities are, likewise, difficult to distinguish on archaeological grounds alone.

Overall, there are no signs that occupation was not continuous, or that any building was abandoned early. I am assuming therefore that all the sites were formally abandoned at the same time.

In the open areas, deposits overlying Inca 1A terrace soils are not sealed. With reservations, I think that the lowest, undisturbed spits are contemporary with Inca 2 in the buildings. The areas were probably used throughout the occupation of the sites and, open to the elements and unlikely to have been subjected to housework, their Inca-period soils can be considered 'occupation deposits'.

CHART 2. Relative chronology in the Inca period, lower Cusichaca:  
organisation of site sequences into the valley sequence

VALLEY

| SEQUENCE     | [PRE-INCA] | INCA I          | INCA II   | INCA III  | INCA IV | POST-INCA |
|--------------|------------|-----------------|---|-----------|---------|-----------|
| Q2-1         | (Chart Z)  | Inca 1A-1B      | Inca 2  | Inca 3    | [?]     | /         |
| Q2-2         | present    | Inca 1A         |   |           |         |           |
| Q1           | [present]  | Inca 1A-1B      | [Inca 2/4 pits]<br>Inca 3 floors<br>walls<br>Inca 3/4/Post-Inca soils |           |         |           |
| Q1B          | [OGS]      | Inca 1A-1B      | Inca 3  |           |         | /         |
| Q4-1         |            | Inca 1A-1B      | [Inca 3]  |           |         |           |
| Q10          |            | Inca 1A-1B      | [Inca 3]  |           |         | /         |
| Q1 canal     |            | Inca 1B (canal) |   | [burials] |         |           |
| Q1 tableland | [present]  | Inca 1A         |   |           |         |           |

The sequences on each Inca site have been combined to form a sequence for the whole of the lower Cusichaca (Chart 2, p.86) and this will form the basis for the discussion in Chapter 6.

### C. The relationship of the artefacts to the soils: Inca period

#### C-1. Chronological succession

At this stage, I am concerned with the first appearance of a pottery ware in an undisturbed deposit, and only then in its subsequent reappearances in similarly sealed and undisturbed contexts. Its appearance in a redeposited soil is of no value for its systematic chronological behaviour, other than to provide a *terminus post quem* for its first use on site.

On all sites bar Q2-1, soils of INCA I are almost completely devoid of artefacts. The few fragments may be casually residual or builders' refuse. They do not relate to a systematic use of the sites, and they pre-date the main Inca occupation.

The Inca 1B features in Q1, sealed by the floor, contain items which were deliberately deposited immediately before making the floors and occupying the site. (They may foreshadow the use of the buildings in some symbolic way).

INCA II, INCA II/IV and IV features contain artefacts which I think are *in situ*. They are contemporary with the occupation of the buildings and sites, and should reflect localised activities.

INCA III soils and features contain objects which are redeposited along with their soil. They are therefore no later in date than those from INCA II features, and their locations and associations are of no value in discussing the activities normally carried on in the building.

The upper parts of deposits in open areas are always disturbed, but I think it probable that the lower spits and their contents may derive from Inca activities on the spot, beginning in INCA II.

#### C-2. Residual pottery

It is clear from this that a number of the soils in the sequence were redeposited, and this increases the chances of finding residual pottery. By 'residual' I mean sherds from pots in use at an earlier date, now incorporated in a casual way as part of the soil composition. The sherds in INCA I and INCA III soils were 'hard core', perhaps deliberately so, and to that extent they fulfilled a contemporary purpose, and were legitimate, functioning components of an assemblage. Chronologically, of course, there is no control, and the relative date of the deposit only provides a *terminus post quem* for pottery of different dates of origin. However, it is much more difficult to identify residual material in occupation deposits such

as INCA II and IV, amongst sherd debris from pots in current use. In modern households in Cusichaca, pots sometimes survive for more than one human generation; a broken pot and sherds from it may continue to be used too. Rims and handles snap off at different times, and are either used for secondary purposes (a cooking pot, for example, fragments into a shovel, a sieve, a flail, a loom weight, and a spindle whorl) or the broken fragments are swept outside with the rubbish, while the dwindling bulk of the mother pot continues to sit in the corner. So sherds from the same pot become incorporated into various deposits, of different relative dates, in various parts of the house and compound (see discussion of similar phenomena in Bankes 1985, 272, and Mayes and Butler 1983).

This scenario is relevant for the archaeological deposits; the first appearance of a ware is easy to fix, and I shall take its longevity at face value, unless there are plausible signs to the contrary, such as a marked diminution in quantity and in size of sherds through time, and increasing abrasion of the sherds not resulting from use (see discussion of residual pottery in Millett 1979).

### C-3. Spatial distribution

Kendall has discussed the architecture of the Inca sites in terms of the day-to-day activities of the inhabitants and of the overall role of the sites in the Inca scheme. From the chronicles she listed different activities performed in Inca societies, and the kind of

building or area required for each was described in theory and then identified on the ground (Kendall 1985).

This identification of the spatial organisation of activities was applied to each site and to the whole valley; it was suggested that each site was custom built, with a primary purpose, and was occupied by a unique population. Both for the sites and for the individual units within them, however, Kendall suggested a number of 'functional' possibilities.

The chronicles describe an Empire with a complex hierarchy. Ethnic origin, place of origin, kinship, sex, age, skill, and so on, were represented by nuances of status, each rank with a prescribed role. So the term 'functions', applied to the activities on an Inca site, has more than a simple, practical meaning.

It is a logical procedure to see if the distribution of artefacts reflects the architectural distinctions of the Inca sites in Cusichaca, and can be linked thereby to the activities of a spatially-organised, complex society. Assemblages should be chosen, therefore, from contexts which are contemporary with one another, and which derive from the primary use of the buildings and areas (INCA II and INCA IV soils), not from construction, refurbishment or collapse. In practice, however, because INCA II and INCA IV soils contained very few artefacts, some compromises had to be made.

In Section A, I referred to the use of 'local' soils for levelling deposits. A redeposited soil, then, will contain pottery originally in use on that site. If at any time the peculiar functions of a site were reflected in its pottery (see discussion in Reece 1979, 83-5, for example), then the collections from the INCA III and topsoil spits, representing amalgamations of activities, may have some potential in terms of comparing one site with another.

But the activities assigned by Kendall apply to the primary use of the sites, so is there any point in trying to interpret variations in collections from secondary deposits in terms of her hypotheses? First, the Inca occupation in Cusichaca was short; this does not prove that original functions would not have changed, but it becomes more unlikely. Secondly, there are no signs that the occupied area of any site changed in extent to accommodate a population of a different size during the Inca period. But, thirdly, there are signs that some buildings were altered (e.g. B1 at the west end, B28 at the eastern, Q2-1: see Appendix 7, map 2; Kendall 1984, 272), although this is very rare. In most cases, alterations were replacements of original fittings only (e.g. B68 in Group 3; B76 in Group 4 north, Q1: see Appendix 7, map 3), and most buildings were not altered at all. As a basis for discussion, then, I think that Kendall's hypotheses are relevant for the interpretation of spatial variety in collections which derive from both INCA II and IV deposits, as well as INCA III and topsoils. Comparisons will be made between buildings, areas and sites in the first instance, and between sites only in the second.

## CHAPTER 6. Chronological and spatial behaviour of the pottery wares

In Chapter 3, I discussed in theory the study methods and their implications. In Chapter 4, the study was put into practice, and the relationship between different ceramic characteristics was discussed, using potting technology as the basis and linking principle. In Chapter 5 I presented the archaeological evidence (Section A), constructed a relative chronological scheme (Section B), and discussed the relationship of the artefacts to the soils of the Inca period (Section C).

Part I. Chronological succession of the wares on Q2-1. Phases are lettered A to Q. Phases A to H are pre-Inca; K to Q Inca: see below, and Chart Z).

### Phase A

Sample 425 is the earliest material on the site. However, it is represented here by one sherd only. It is absent everywhere else in the valley, bar Q2-2, where it occurs frequently, post-dating Sample 24 and surviving into much later soils. Its closest stylistic affiliations are with so-called 'Middle Horizon' or early 'Late Intermediate Period' bowls from Pikillacta (see Appendix 8). I find its position here, sealed beneath floor surfaces and successive deposits containing pure 'Chanapata' material (see Appendix 1:1, p.150) incomprehensible, unless the overlying deposits are deliberate backfill with residual 'hard core' (but see Kendall 1976, 47-51). 'Early Horizon' pottery (see Appendix 1:1, p.150), appears low down



in the sequence, and continues to the surface, where it occurs in large quantities. Its fabrics are soft, however, and sherds become progressively more comminuted as they are incorporated in later and later soils. In all [A] contexts, where it appears early, and alone, all of the sherds are large and fresh. There is not, however, a sudden decrease in quantity in the levels above where new wares appear, and it is hard to mark an absolute cut-off point where this kind of pottery ceased to be in regular use. However, the [B] features and soils represent a change in activity on the site, and new items begin to appear.

#### Phase B

Sample 24 is one of the most interesting materials on site and, like the 'Early Horizon' pottery, it continues to the surface. It is always found in small fragments. Its fabric is similar in petrology and texture to that of some of the 'Early Horizon' wares, and also very similar to that of Ware 12. All three types comprise pots with very thin walls, and many sherds of each type are encrusted with carbonised food residues and have surface discolourations. The slipped, smooth surfaces of Sample 24 resemble that of 'Early Horizon' pottery too, but they are polished with a scribbling action which is unique. The surfaces of the Ware 12 pieces are usually matt. However, it is possible that some of the 'Early Horizon' pottery, Sample 24, and Ware 12 were the products of the same tradition, spanning a long period of time, churning out thin-walled, low-grade pots for domestic use.

Vares 24, 54, 57 and Sample 400 resemble one another in their shapes and decorative style. They all comprise thick-walled jars and flat-bottomed bowls or dishes, both plain and painted, with and without food residues. All could have been made from local or adjacent materials. Large, fresh (and some adjoining) sherds appear throughout to the surface, and not only in redeposited soils. They can be seen best, I think, as the non-specialised products of stable traditions, and the evidence suggests that they remained in production for most of the prehistoric period, including at least the beginning of the Inca period in Cusichaca. Only one chronological tendency can be identified: on Vares 24 and 54, undulating motifs occur less frequently on sherds from later contexts, and rectilinear designs begin to appear in the overlying [C] soils.

Simultaneously, Ware 45 appears. This is a fine ware, never used for cooking, made from non-local materials. In shapes and painted style, it resembles Killke pottery from Cuzco, although few of the evolutionary tendencies described by Dwyer can be recognised here on examples from successive strata. The earliest examples are often painted with large-scale monochrome designs, on surfaces which naturally fire a pale colour. Some examples from [F] to [H] deposits, and from above, have decoration which is slightly smaller in scale, bichrome, more rigidly geometric, and which sometimes overlies a white slip. In all other respects the ware remains the same. It is not possible to say that this imported ware 'influenced' local production here, although there are stylistic similarities. Wherever the place of origin of Ware 45, it continued to be imported, and

formed a regular, numerically significant component of all later assemblages. Using the same kind of evidence as that for Ware 24 *et alia* above, I think that it continued to be imported, at least into the early part of the Inca occupation.

In hand specimen, its fabric resembles that of Wares 29 and 28 (see below, p.96).

### Phase C

The deposits comprising [C] are difficult to interpret; needless to say, they are crucial in understanding the succession of the wares, and span a most important period. On excavation evidence, they can be separated into two components: a slightly harder-packed upper soil, occasionally with traces of pedological development; and a lower, looser and more stony soil. In the lower, sherds lie in random orientations, and I think that they and their soil were redeposited to form an artificial terrace.

The new wares in these lower soils are:

- a) Ware 28. In decorative styles and shapes, this resembles Ware 45 quite closely, but it was made from different materials, and the fabric was tempered. Its place of origin is unlikely to have been the same as that of Ware 45, but it was almost certainly not made locally, either. It is present in small amounts here, and in upper soils.
- b) Ware 40. There are few examples of this ware, all of the same shape. Its fabric was made from a naturally sandstone-rich river

clay. The shape resembles Ware 13, Form H, but poorly made and finished.

c) Ware 69. This may have been made from local materials, but using a new, paler-firing clay. It appears consistently from now on, although always in small quantities. In decorative style, particularly in tonal contrast, it resembles the earlier Ware 45 sherds.

Therefore, there are similarities between two of these wares and Ware 45, and one important difference. Andesites are regular components of several fabrics from now on, both as natural inclusions and as a tempering material. But it appears here first, in Ware 28, suggesting, perhaps, the sporadic beginning of a new supply of fine wares.

Although it is dangerous to talk about relationships between wares which were not made locally, and for which, therefore, there is likely to be incomplete evolutionary evidence, nonetheless, the visual similarity between the fabrics of Wares 28 and 45 is interesting. Pushing this as far as it will go, I would like to say that Ware 28 was the product of an industry copying Ware 45 as closely as possible. Were this true, and were Ware 69 another 'spin-off', then Ware 45 could be seen as an important influence on other traditions, familiar with its trade pieces. Ware 40 was made from a unique untempered fabric, but its angular pots are distinctively different from the shapes of the preceding and contemporary wares, and are similar to those of Wares 13 *et alia*, which appear in the soils above.

Although absolutely later in deposition than the [B] soils, I am suggesting that this [C] soil is redeposited, and there is no sign of these wares *in situ* in contemporary or earlier features or soils. Therefore, although I have implied that they post-date Ware 45 in Cusichaca (and elsewhere), this is not based on reliable evidence.

Sandwiched between the upper and lower [C] soil components are a few sherds of Ware 29. Its fabric is similar in petrology and general appearance to that of Ware 28, and is also tempered. But the temper is a porphyritic andesite, the pots were made piecemeal, and in style and shape they resemble Cuzco Inca Polychrome.

In the top of the upper [C] soil component, Wares 9, 11, 12, 13, 15, [23], 27, 66 and Sample 155 appear. Of these, Wares 13 and 27 were andesite-tempered, made piecemeal, and are identical to Cuzco Inca Polychrome in style. Ware 9 was made from a dark-firing granitic river clay, but was also made piecemeal, and the shapes, at least, conform precisely to those of Cuzco Inca pottery. Ware 11 was made from a pale-firing, granitic and quartz-rich river clay, and bears some resemblance to Forms B and H in Wares 13 and 9. Ware 12 I have discussed above. Ware 23 was slate-tempered, and comprises thin-walled cooking pots. Both of these 'specialised' cooking-pot wares continue as regular components of assemblages to the surface, although never in large quantities.

There are two other new fine wares in this soil, neither resembling Cuzco Inca. Ware 15 is present in minute amounts, and in small sherds: complete pots are impossible to reconstruct. Its fabric was andesite-tempered, indistinguishable from that of Ware 13, but the body sherds were painted in the 'Lucre' style (see Appendix 1:1, Ware 15, and Appendix 8). The fabric of Ware 66 was made from a clay containing clasts of andesite and trachy-syenite. Its style of decoration is close to that of the later examples of Ware 45, but the designs are particularly small-scale, neat and methodical. Sample 155 has too few examples, all too small, for discussion.

All of these wares continue to the surface. They appear here first, on the surface of a terrace which marks the beginning of a new pre-Inca building phase: the structures on the terrace underlie INCA I deposits. Moreover, Wares 13, 9 and 27 are present in quantity, and in a variety of shapes: all the formal and decorative variations encountered in higher deposits appear here.

#### Phase D

Ware 1, another specialised cooking-pot ware, appears in the buried humic soil which overlies [C]. It is present in large amounts from here to the surface. The pots were made from a granitic river clay, and could, of course, have been locally made.

#### Phases E to H

Associated with the latest pre-Inca building activity are Ware 4 - made piecemeal, and identical to 'Cuzco Plain' cooking pots - Ware

73 and Sample 126 ; both these were made from tempered fabrics. Ware 73 comprises large, medium-thin walled, wide-mouthed jars, with squared-off rims similar to those of Form H in Ware 13. It is rare on Q2-1, but continues to the surface. Its mode of manufacture is not known. Sample 126 is an unusually fine-textured fabric, made into fine wares painted in the Cuzco Inca Polychrome style.

#### Phase K

Inca 1A soils contain potsherds as hard core. Almost all the wares appearing in the earlier soils appear here too, with some new additions: Wares 21, 26, 39 and 71. All are rare in subsequent deposits.

#### Phases L, M

Inca 1B soils contain little pot, and nothing new.

#### Phase N

INCA II features have only been identified in B20. They all contained Ware 54 sherds and 'Early Horizon' material.

#### Phase P

INCA III soils contain nothing new. Their ceramic contents are identical to those of Inca 1A and Inca 1B.

#### Phase Q

The ceramic assemblage of INCA IV is similar to that of the underlying Inca period soils, with fewer wares, none new.

In the topsoils appear Vares 6, 8, 50, 74 and Sample 176. Ware 6 is a fine-textured, open-mouthed jar. Ware 8 is a modern cooking pot, made on the Altiplano (the high, flat upland region extending north from La Paz. See Bankes 1977, 45 and plate on p.46). Ware 50 is a brittle, thin-walled ware, using a pale-firing clay, and similar in decorative style to Ware 69. Ware 74 is an umbrella term used for glazed majolica bowls and jars; this industry began in the Americas in the early post-conquest period and continues to the present in Peru on the Altiplano. Sample 176 was made from an andesite-tempered fabric, and is produced nowadays in Raqchi. It would be convenient to see this as the latest product of an andesite-tempering tradition, distributing from one centre of manufacture, beginning before Phase C - but the intervening stages from the latest Inca occupation to the present day are missing (see Appendix 6).

To summarise so far:

By the end of the Inca IA levelling activities, almost all of the pottery in use on the fort site to the end of the Inca occupation is present. This means that the Q2-1 'Inca' assemblage is present on the site before the beginning of the Inca building activities. And in the subsequent soils, considering not just the identity of the contextual soils, but the freshness, size and quantity of the sherds, I think it is reasonable to say that Wares 1, 4, 9, 11, 13, [24], 45, 54, 57, 66, 73 and possibly Sample 400, comprise the functioning members of the fort assemblage in regular domestic use. All of these wares appear on Q2-1 before the first signs of the Inca occupation. Once a new ware appears, it remains in subsequent soils in similar



quantities (although the different conditions of sherds in redeposited soils and in topsoils makes comparisons difficult). There is almost no replacement of one ware by another and thus the total number of wares used on site increases through time.

It is possible now to trace the longevity of the major technological traditions. As I suggest above, the new tempered wares of Phase C do not seem to replace any of the pre-existing untempered pottery: tempered wares, some made piecemeal and perhaps mass-produced, co-exist from now on with products which may have resulted from more casual, low-key enterprises. Against this background, it is possible to consider formal and stylistic evolution. There are few cases in which decorative changes occur (Wares 24, 54, 45) but, again, there is no replacement of one style by another. This suggests that new wares are likely to be stimulated by, or influenced by, wares already on the market, but thereafter, they retain their autonomous characteristics and respond to no further influences. However, I am discussing a collection, a large part of which was almost certainly imported, and from an unknown range. Conservatism in pottery may result from conservatism of consumers, not producers, or from a deliberate restriction on what was available.

Part II: Spatial distributions of the pottery in the Inca period  
(Charts A to M).

"His office was the same as Sandvik's ... same type of furniture, fabrics and carpet, a reflection of prevailing style, but no clue to the occupant" (Francis 1973, Chapter 10).

In this discussion, I am looking for patterns. These might include the co-variance of two or more wares, or the recurrence of identical groups of wares. As a framework for interpretation, I shall begin by using Kendall's classification and interpretation of the architecture (1985), in which particular kinds of buildings are matched with particular activities. Kendall uses this scheme to identify the main functions of the sites' sub-areas, as well as those of each site as a whole (see Chapter 5, Sections A and C, and Appendix 7, maps 2 to 5).

I use pottery from contexts which date from the Inca occupation, i.e. from INCA II onwards, and I have excluded material deriving from identifiable post-Inca activities or from building collapse after the occupation. I deal with the pottery as 'wares': most wares are represented by one predominant form, but many sherds cannot be assigned to a particular form at all (see Appendix 1-1). Usually, I characterise an assemblage by the presence or absence of wares, and not by relative quantities: these are meaningless, unless pegged to an estimate of original numbers of pots. But evidence suggests that, in some assemblages, broken pots and sherds may have been in use, as well as complete pots (see Chapter 5, Section C). Only in very few

cases am I certain of the condition which all of the pottery was in while being used in that place.

There is a vast quantity of pottery from the Inca-period deposits: it comprises c.75% of the sample (see Chapter 3). Therefore, even with this simplified arrangement, I think that if patterns are present, they will emerge.

First, I describe the major characteristics of each site's assemblage (Section 1). Secondly, I will describe the assemblages from individual units within the two largest sites, Q1 and Q2-1 (Section 2). Third, I shall discuss the correlation of the pottery assemblages and other phenomena: a) is it possible to identify any activities, such as cooking or storage of goods, on the basis of the excavation evidence and the associated artefacts? (Section 3a). b) Is there any correlation between architectural groups and assemblages? If so, do Kendall's proposed functions for each group seem reasonable in terms of their pottery contents? (Section 3b). c) Does each site have a unique assemblage? If so, can this be explained in terms of each site's individual rôle in the Inca organisation of the valley? And do these rôles 'explain' the assemblage compositions? (Section 3c). In the Conclusions, I will review the evidence, and see if any factors other than 'function' can be introduced to explain the pottery distributions.

1. Q1E, Q4-1 and Q10 (Chart A)

It is difficult to discuss these assemblages in detail. Most of the pottery derives from spits in topsoils, which overlies construction deposits containing very few artefacts.

Q1E has an assemblage which is very similar to that of Q1, particularly that of the Q1 buildings. It comprises Wares 1, 4, 9, 13, 27 and 29. Wares 11, 12, 23, 26, 28, 39, 40, 45, 71 and 73 are also present in lesser quantities.

Pottery in the pre-Inca traditions is very rare (see Part I above, and Appendix 1-2): Wares 28 and 45 both resemble Cuzco Killke, and both, probably, were imported. All three cooking-pot wares are present (1, 12, 23), as are both the 'storage jar' wares, 39 and 73. Of the remainder, 4, 9, 13, 26, 27 and 29 (and perhaps 71) encompass almost the entire range of the Cuzco Inca-type pottery found in Cusichaca: and all of it was probably imported. Wares 11 and 40 are the two wares which may be thought of as 'spin-offs' of Wares 13 et al. Ware 11, at least, was probably imported.

Q10 lacks any such 'spin-offs' and Ware 45, or anything resembling it. Its fine wares are all in the Cuzco Inca Polychrome mode. This is in contrast to Q4-1, whose fine wares are 45 and 66, resembling one another and Cuzco Killke in decorative style. Otherwise, both sites have the same wares: 1, 4 and 9 (all present on all sites), 54 and 57.

On Q2-1 (Chart A), the 'site assemblage' is broadly based. The most common wares are 1, 13, 45, 54 and 66, with Wares 9, 69 and Sample 24 being fairly common. The other wares, particularly those unique to this site, put in more sporadic appearances. All wares which appear more than once appear in both buildings and areas.

For Q1 (Chart A), the 'site assemblage' is based on Wares 1, 9, 13 and 29. Wares 4, 11, 12, 27, 45 and 54 are common.

2. On Q2-1, the most striking characteristic of its assemblages is their variety (Charts B, D to G). Of the eleven excavated buildings, no two match one another in their pottery contents. In no building or area does there seem to be a systematic co-variation in wares: for example, to take the most extreme case, a small number of plain, utilitarian wares does not mean that there is a large quantity of fine painted wares. All of the buildings (bar B5 in Group 2: see Appendix 7, map 2), and all areas (bar A3 in group 1) have cooking pots of some kind. Most of the buildings have c.30% so-called 'imported, mass-produced' pottery of Cuzco Inca type (see Appendix 1-2), but the spread is wide, from all of the pottery being of that type (B5), to less than a quarter in B1 (Group 1) and B4 (Group 2). As for the buildings, so for the areas; A33 (Group 4) has the most distinctive, because most restricted, assemblage.

In contrast, all of the buildings and areas on Q1 have very similar assemblages (Charts H, K, L, M). A 'building assemblage', based on Wares 1, 4, 9, 13, 27 and 29, can be distinguished from an

'area assemblage' of Wares 1, 9, 11, 12, 13, 29, 45 and 54. But no building or area has these wares only. Each has a unique assemblage, but the variations are within far narrower limits than on Q2-1.

3a. Of all the wares in the valley, only cooking pots can be identified as a functional category (see Chapter 4). All the wares which appear in the valley more than once do so in different kinds of contexts, and in association with a variety of other wares. Other archaeological evidence for the use to which any building or area, or parts of them, were put is lacking: so it is impossible to say that such-and-such a range of pots was used for a particular purpose.

3b. According to Kendall (see Chapter 5, Section A, and Appendix 7):

a) B1 (Group 1) on Q2-1 was occupied by the "army C.O. and his family". This implies that the pottery assemblage from this building should be absolutely different from all others on the site, but it is not. It has few wares, but so have B5 and B6 in Group 2.

b) B19 and B20 (Group 3) are both called "storehouses", and therefore their assemblages should be similar. So they are, more similar than those from any other pair of buildings, and sharing a large number of wares (but lacking, ironically, the so-called 'storage jars', 39 and 73). But these two assemblages also resemble that of B17 (Group 3), which Kendall identifies as a "barracks for enlisted men".

There is no striking similarity in the assemblages from B4, 5, 6, 7, 8 or 9 (Group 2), the "housing for low-rank families": the assemblages are remarkable for their variety.

With the exceptions of A22 and A30 (both group 3), the area assemblages do not resemble or complement those of their most adjacent buildings, nor, over-all, are the area assemblages different in ware composition from those of the buildings.

Q1 is the largest site in the valley, and has the greatest architectural variety. B13, 14 and 15 (Group 1: see Appendix 7, map 3) supposedly housed an imported *mit'a* population in state service, not family units. Therefore, we might expect that the three assemblages would be similar: they are, and similar to those of their adjacent areas. However, they share their assemblage in all but one respect with B68 in Group 3 (part of the group housing the "local Inca representative and including a *tambo*, or inn"), and with A18 in Group 2, part of the "*curaca's* compound". There is no marked similarity in the assemblages of B68 and of its adjacent areas, 66 and 67, nor in those from B76 and B77 (Group 4, north: "housing for family groups of *mitimaes*"). Nor is there any marked difference between the Group 3 and Group 4 assemblages.

From these descriptions, it seems impossible to correlate Kendall's architectural units within a site with distinctive pottery assemblages. Architecturally similar buildings do not have similar assemblages, and the assemblage composition of each group of such buildings is not distinctive.

3c. It is clear from Chart A, and from the preceding discussions, that each site has a unique assemblage, but each assemblage is a

variation on a theme which always includes Wares 1, 4 and 9. Q2-1 has the largest number of wares; those unique to the site are Wares 15, 21, 31, 50, 58 and 69; Samples 24 and 155. Q1 and Q1E share Wares 39 and 71, the only wares in the valley absent from Q2-1. The small sites Q1E, Q4-1 and Q10 each have a smaller number of wares, and distinctive assemblages.

But do these distinctions mean anything? I think that for Q10 and Q4-1 in particular, there is meaning. Q10 is 'Inca' in the Imperial sense; both its architectural style and its pottery are imports, and therefore in accordance with the peculiarly Imperial (ritual) rôle which Kendall assigns to the site. Q10 is difficult of access; it shares this characteristic with Q4-1, whose pottery, in contrast, has marked non-Inca characteristics. Q4-1 shares a hilltop with a non-Inca site (Q4-2) and is adjacent to others (Q5, Q3, Q2-2); Kendall gives the site an agricultural role, which could be seen as a continuation of local subsistence practices.

Q1E, linked physically to Q1 by a road, has a pottery assemblage very similar to that of the larger site. This, again, is in accord with Kendall's hypothesis, which proposes that Q1E be the local religious site for the town. However, here, as on Q10, any ritual dimension, in terms of special pots (or other kinds of special artefacts) is lacking, although both sites have a similar, high relative proportion of tempered to untempered wares (see Appendix 1-2), in contrast to the other three sites.



Q1E, Q4-1 and Q10, to judge by their size, must each have housed a small population: one 'unit', perhaps, either of family or of work. Following Kendall, each can be seen as a unique, specialist site, and the assemblage compositions do not contradict this view. Q2-1, Kendall's 'fortress', can be seen in the same way, housing one kind of population (military), and with one primary function. But the site is large, and Kendall's inhabitants would have been ranked. The variety in the individual assemblages may seem surprising, at odds with modern ideas of military uniformity and with the site's own architectural personality. The site assemblage is broadly based, and encompasses Cuzco Inca and a number of non-Inca and Inca-influenced wares (Appendix 1-2). This is in sharp contrast to Q1, the site which should be quite different from any other in the valley. This is Kendall's 'town' site, housing a polyglot population. Its ceramic assemblage, although broadly based, is less varied than that of Q2-1, and the majority of its wares are either of Cuzco Inca type or show some Inca stylistic influence. But apart from recording the facts, it is impossible, for the present, to say anything more about the Q2-1 and Q1 assemblages: each site is unique, and there is not the basis for comparison which exists for the smaller sites.

### Conclusions

Until now, I have concentrated on one reference point: Kendall's functional view of the architecture. Therefore, I have not considered the presence/absence of individual wares because, with the exception of the ubiquitous 'cooking-pots', no function can be assigned a

priori to any form in any ware. So I have dealt with 'assemblages', looking at them on two levels.

First, using individual assemblages from buildings and areas, we have seen that no two units contain the same assemblage: the variations on Q2-1 are very marked, much less so on Q1. Also, groups of similar buildings do not have a distinctive range of pottery wares. This means that there are no patterns in the assemblages which match those of the architecture, as Kendall presents them. Therefore, either Kendall's matching of function with a particular kind of building is wrong, or it is correct, but the pottery just does not reflect those functions in the same organised, spatial way as the architecture. One reason for this may be that pots (or parts of pots) were multi-purpose. In that case, 'functions', whether or not they are the same as Kendall's, will not explain a pot's presence or the composition of an assemblage.

On the second level, each site has a unique assemblage. This seems to fit well with Kendall's view of the sites' individualities; and, on the small sites, given the roles which she assigns to them, some aspects of the assemblage compositions seem logical (relative proportion of Inca-type to non- or pre-Inca type pottery, for example). But Kendall used the architecture to suggest the functions, or principal function, of each site, in the same way as she distinguished functional units within the sites, and we have seen already that 'functions' defined in this way do not explain assemblage composition.

If we look at the sites afresh, we can see that the Cusichaca river divides them into two groups (Appendix 7, map 1). On the west side are Q1, Q1E and Q10, the first two easy of access from most directions, Q10 not. So terrain alone could account for how easily each of these three groups of people could obtain imported pottery; this would explain the limited number of such wares on Q10, in contrast to the large number on Q1 and Q1E (including the two wares with the biggest pots, 39 and 73). And we could use the same argument to account for the contrast between the Q2-1 and Q4-1 assemblages. However, while explaining the quantity of wares, terrain and ease of access do not explain why particular wares were present on any of the sites.

On the west side of the river, there is much less pre- or non-Inca settlement near to the Inca sites than on the east side. Q1E was built on virgin land, and there are no pre-/non-Inca sites nearby. The same applies to Q10. At least a small part of Q1 now seems to overlies an earlier terrace system (1985 excavations), and the caves above the town and the tableland to the north witnessed some pre-Inca activity, although there are no settlement sites. On the east side of the Cusichaca, Q2-1 and Q4-1 are adjacent to non-Inca sites, and there are a number of others close by. Q2-1 overlies a settlement which was occupied until the beginning of the Inca building programme.

The relative percentage of pre-/non-Inca to Inca or Inca-type wares (see Appendix 1-2) is far higher on the eastern sites than on

the western. Of the western group, Q1 has the highest, while both Q1B and Q10 have substantially less. Apart from the 'Early Horizon' pottery on Q2-1, I am sure that none of the non-Inca wares on any of the sites is residual. So we have a situation in which the relative percentage of non-Inca to Inca pottery fluctuates, site by site, in proportion to the proximity and extent of pre- or non-Inca settlement.

This situation might arise if traditional supplies in the hinterland continued to operate in the Inca period, and provided pottery for the new Inca sites in the immediate vicinity of their old consumers. But whereas this might account for the distribution and quantity of pre-Inca wares, those of the Inca, Inca-type, and new non-Inca pottery are not explained at all. Supply routes would take on a very directional aspect, difficult to understand in one small valley unless we could explain the mechanics of the movement of pottery from consumer to maker (who fetches, who brings?). And why should the traditional wares be appropriate in these new settings?

If terrain and ease of access, and proximity to traditional trade networks, do both have a bearing on some aspects of the pottery distributions, then this suggests that the presence of each ware on a site may have to be explained individually: there will be no single explanation for the composition of a site assemblage *en masse*. There are two ways of looking at the problem: first, what was available? The two situations described above relate to this; and we might include, too, non-economic Imperial strategies with prestige wares

(compare Morris 1978, 322 and 323), although we have no corroborative evidence for these in Cusichaca. These three situations might restrict the range available, but they do not explain why, on each site, different pots were chosen from the range. So secondly, we would need to look at each site in turn, and consider, for example, what was the percentage of re-housed, indigenous inhabitants as opposed to *mitimaes*? What was the relative value of each ware, and what (and how much) was available in exchange? But we have no archaeological evidence from Cusichaca with which to answer these questions at present.

## CHAPTER 7. Conclusions

"The whole time they are playing a ball game, and following definite rules at every throw" (Wittgenstein 1958, note 83).

This final chapter is the mirror-image of Chapter 1. I shall describe a sequence of events which took place in Cusichaca, and work from there outwards. This means that there are some topics which I shall not touch upon again because it is clear that my evidence has no bearing on them. For example, I cannot discuss the ritual value a pot may have had because, on the whole, we lack other than domestic contexts.

The earliest pottery on Q2-1 is of 'Early Horizon' type. As far as I can tell, it resembles Early Horizon pottery from Cuzco in every respect, and there is no sign of any original development here. This may mean that, at least at first, the pottery was imported and (based on present knowledge of the distribution of Marcarvalle and Chanapata wares) probably from the south. One of the fabrics used to make utilitarian wares of Chanapata type is indistinguishable from Sample 24 and from the fabric used for Ware 12. Together, these span the entire prehistoric period in Cusichaca. In Cuzco there are radiocarbon dates in the middle of the first millennium BC for 'Early Horizon' pottery.

There is no visible sign of a break in occupation or a discontinuity following these deposits on Q2-1. But evidence from Q2-2, the site on the tableland behind Q2-1 (see Appendix 7, map 1), suggests either that an abandonment of the fort site has passed unnoticed archaeologically, or that there was simultaneous occupation on both sites of two entirely different kinds (see p.116). The third alternative, that the Q2-2 occupation pre-dated that on the fort, is untenable if the comparisons with Early and Middle Horizon pottery from the Cuzco area are thought convincing. The Q2-2 architectural evidence comprises the bottom courses of faced walls which surround a courtyard, and a small, oval house; these structures are formally unique in the valley. They were abandoned, the site was levelled, and a topsoil developed through the top layers of the levelling deposits, thus chronologically isolating the building complex. There is very little pottery associated with these buildings; also, of course, it is in minute fragments with abraded surfaces, and was made from untempered granitic fabrics. The diagnostic pottery from the levelling deposits is of three kinds: first, rare, small sherds of 'Early Horizon' type, beginning at the base of the soils. Secondly, also originating in the basal soil, are a number of sherds unique in shape, painted decoration and fabric. Their closest parallels lie in some so-called 'domestic' pottery from Pikillacta (see Appendix 7, map 7, and Appendix 8). Small amounts appear in the OGS, and in the terrace above, dwindling in sherd size and quantity to the surface. None at all appears on the fort. Thirdly, there are sherds of Sample 24, appearing first slightly higher in the deposit.

There are no relevant radiocarbon dates for the comparable material from Pikillacta, but the building of that site is thought to date from no earlier than the Middle Horizon period, in the mid-first millennium AD.

On the fort, the earliest anthropogenic soils are cut, in places, by graves. It is not always possible to tell from where these were cut originally, nor do they contain grave goods. But some pre-date the next building phase (see Hey 1984) and they may be contemporary with the buildings on Q2-2 described above. Elsewhere, however, the earliest soils are overlain by soils associated with new, rough stone buildings and terracing. 'Early Horizon' pottery and sherds of Sample 24 continue, and to the top of the sequence, but in steadily decreasing quantities and sherd size. Wares 24, 54, 57 and Sample 400 appear, and all four are usually associated together; the relative percentages of one to another vary slightly, but in a way which seems random in these limited areas. The wares are similar to one another in many respects, and all the fabrics could have been made from local materials. The simple jars, the most prevalent shape, were used for cooking as well as other, unidentifiable purposes.

Like Athena, these wares appear fully-formed, and they continue from here to the surface, changing little. I do not think that they are residual in the upper soils; I think that they continue to be manufactured, and represent therefore a near-perfect balance between producers and at least a section of the population over a long period of time.



Slightly later, but in the same soils, Ware 45 appears. I suggest that it was imported, although I have not identified the off-site context from which it sprang. It is very similar to Cuzco Killke as defined by Dwyer, and in more general ways it resembles Wares 24, 54, 57 and Sample 400. In Cusichaca terms, it cannot have been instrumental in the development of these wares, but it seems to have been influential stylistically, in a small way, soon after it first appears.

Surrounding Q2-1 and Q2-2 are three sites which, for convenience, I have called 'non-Inca': Q3, Q4-2 and Q5. Kendall has described these sites and identified a number of building shapes (round to rectangular, and all stages in between). She concludes, on architectural grounds, that they were probably pre-Inca in origin (1985, 255ff), but 'may have continued to be occupied (in the Inca period)' (ibid., 353). Although the more rectangular in shape a building, the later it is thought to be, she points out that simple vernacular architecture such as this followed local tradition; and, moreover, that rectangular buildings were traditional in the Cuzco area long before the Inca period (ibid., 337ff, 352), thus removing, perhaps, their chronological value.

The pottery associated with Q5 and Q4-2 comprises Wares 24, 54, 55, 57 and Sample 400. Ware 45 is present but rare, and at Q5 it appears late. At Q3, Ware 69 (which appears slightly later in the Q2-1 sequence) is a regular component. Given that all these wares were long survivors in the lower Cusichaca valley, they cannot be used to

give a chronological 'fix' for these sites. The lack of any other wares of the kinds which appear later on Q2-1 could be interpreted in one of two ways, both plausible: either these sites were contemporary with one another, and with Phase B on Q2-1; or they were beyond a frontier of some kind, be it ethnic, economic, political or whatever. And this situation could, in theory, have occurred at any time, and not only in the pre-Inca period. New, small settlements built in the traditional, local manner, appeared in the Upper Mantaro valley at the beginning of the Inca occupation there (see Earle and d'Altroy 1982; Franch 1968, 428, refers to the co-existence of different kinds of communities in the Late Horizon Period near Cuzco). Both Rowe (1963b) and Bonavia (1978) considered that the Inca Empire was essentially rural, not urban; nuclei of Inca settlement may have existed to order and control a hinterland which may have shown no outward sign of Inca-ness (and see also discussions in Morris 1972, 1978, and 1982; and Murra 1975, 76).

These early buildings and terraces on Q2-1 are overlain directly by new terrace soils. It is not easy to decide whether these developed naturally *in situ*, were built up deliberately but gradually, or were artificially deposited in their entirety. Ware 69 appears in the lower part (a local 'response', perhaps, to Ware 45), and two other fine wares appear: 28 and 40. I think that both of these wares were imports: Ware 28 represents the first appearance of the andesite fabrics, at the beginning of this new phase of activity on the fort. Ware 40 contributes a new kind of shape, distinctively angular. The tempering of fabrics with andesite, and angular pot

profiles, remain part of the repertoire from now on. Wares 28, 40 and 69 replace no earlier wares; they simply augmented the fine ware assemblage.

Incorporated in the upper terrace layers, or on their surface, are buildings little different in construction method or shape from their predecessors. Again, the small excavation areas mean that it is impossible to tell whether these structures represent, for example, completely new kinds of activity, or a more concentrated population. But they are accompanied by several new kinds of pottery, some of which differs very much from anything appearing earlier. Taken together, the range of wares is now large and, in some respects, more specialised.

Ware 29 appears first, but is followed directly by a) the other andesite-tempered wares: 13, 27 and Sample 126 (fine wares, whose closest stylistic parallels lie in the Cuzco Inca Polychromes); b) other wares, made in the same way, but lacking the decoration: 9 (untempered), and 4 (formally similar to Cuzco Inca Plain cooking pots); c) two other fine wares, 15 and 66, one in a tempered fabric (15); d) a storage jar made from a unique, tempered fabric: 73; e) an untempered fine ware, 11, which looks like a poor imitation of Ware 13; f) small fragments of a ware, Sample 155, which resembles Wares 24, 54 et al. in painted style; and g) three kinds of specialised cooking pot: 1, 12 and 23.

The assemblage includes a large number of wares which I think are imported but, again, the context in which they originated is unknown. It is tempting to discuss their developmental influences upon one another, but this would be irregular, lacking a finely-distinguished chronological sequence nearer to, or in, their places of origin. I can distinguish no systematic or important influence operating on any of the so-called 'local' wares in these or successive strata, nor did the new pots seem to replace any of the wares already in the repertoire.

So, how to view this enlarged and varied assemblage? There may have been economic, political or demographic changes in Cusichaca, which meant that different wares, already in circulation elsewhere, now became appropriate. but, as referred to above, the evidence is not extensive enough to see whether, for example, the new wares were being used in new ways. But Cusichaca had had access to imported pottery before: and this suggests, regardless of the reasons for the selection, that there was simply access to more: in other words, more kinds of pottery were on the market. This is not to say that all of the wares appearing newly in Cusichaca were absolutely new, but that their availability, at least, was new.

To discuss this, these phenomena in Cusichaca must be given a chronological and cultural context, by comparison with off-site material and events. The architectural remains associated with the pottery cannot be dated independently (see above, discussion of Q3, Q4-2 and Q5); but the stylistic prototypes of the 'Inca' wares are

associated in Cuzco with Imperial Inca architecture and can be placed chronologically, therefore, at the end of the Late Intermediate Period (see Chronology). So far, no evidence from Cuzco suggests that this pottery, in these forms, pre-dates the Empire. The spread of Cuzco Inca pottery beyond the Cuzco valley is seen as a concomitant of the spread of the Empire itself, in its manifold forms. But, if my interpretation of Vares 11 and 40 is correct, then they must post-date the first appearance of Cuzco Inca pottery in their place of origin. They appear here with, or slightly earlier than, their prototypes, suggesting that this phase in Cusichaca must date from sometime after the beginning of the Empire in the Cuzco area, when it had already had an economic impact.

It is possible to see an empire as having a blanketing effect on cultural diversity, particularly in its core areas, and particularly when it is mature. Rowe (1982) refers to aspects of the Inca Imperial system specifically designed to undercut traditional (local) loyalties. But Rowe also refers to "some Inca policies ... designed to perpetuate local differences" (1982, 94) and says that, by 1532, there had been insufficient time "for much cultural unification to [have taken] place" (*ibid.*). Amongst others, Lumbreras (1974), Bawden and Conrad (1982) and especially Pease (1982) emphasise the heterogeneity of the Empire's population (and see above, p.22); and, as the recognised Imperial boundaries extended, so, of course, did the number of distinct tribal personalities which they encompassed. And in addition to this aboriginal variety, there were some Imperial changes: people were moved, either *en masse* or in smaller groups, for

punitive, administrative, military or economic reasons (see, e.g. Kendall 1985, 117); so traditional population compositions and densities were changed, and the imposition of the Inca social/administrative hierarchy created fine distinctions where none, or different ones, had existed before. And it seems quite likely that an Imperial presence in the vicinity would affect the populations living beyond its frontiers: tribal identities might polarise, for example, and different kinds of compromise with the Empire be made.

Between the multifarious people of the Empire, and between them and the centralised government, what kind of economic relationships existed? Inca marketing systems have been thoroughly discussed (e.g. Earle and d'Altroy 1982; LaLone 1982; Murra 1986) and there seems to be a consensus of opinion that no free markets (either the system or the places) existed within the Empire, particularly in the 'core area' of the Cuzco valley and its environs, which would seem to include Cusichaca.

But how firmly drawn were the Imperial frontiers at any one time? If the movement of goods, people and ideas across them is of interest, how are they to be recognised at all if they were not identified in the chronicles? (and, conversely, if no such movement took place, how will it be possible to recognise a contemporary phenomenon, given that radiocarbon dating is unlikely to provide such fine or firm chronological distinctions?) Julien (1981, 139-41) showed that discrete pottery distributions matched the known historical boundary between two Imperial administrative areas in the

Puno area, and evidence suggested that the boundary was pre-Inca in origin (see Rowe 1982, quoted above, p.121). For Cusichaca, too, there is some independent evidence. The chronicles (quoted by Kendall 1985, 344ff) refer to Inca Urcu seeking help "below Ollantaytambo" during his revolt in the early part of Pachacuti's reign. So it seems as if the Incas themselves did not consider that area, which must include Cusichaca, to have been within the Imperial jurisdiction at that time.

So far, then: within the early Empire, evidence suggests that the population was heterogeneous, and that in some areas it was immigrant. The heterogeneity was in part aboriginal, a by-product of rapid assimilation, and perpetrated as a matter of Inca policy, and in part it was new and artificial. Cusichaca was close to the core area of the Empire, but beyond its frontiers.

Rowe (1944) suggested that Cuzco Inca pottery was mass-produced. Ware 13, and the other Cusichaca wares which match his specifications for 'Cuzco Inca', were made piecemeal, which is appropriate to a production-line mode of manufacture. Also, these wares are standardised in all respects, and limited in repertoire, two characteristics which are usually thought to indicate mass-production. Welbourn (1985) has criticised this traditional assumption, but for Cuzco Inca pottery, we have evidence for a very large total output. It is ubiquitous in the latest pre-Spanish contexts in Cuzco, and, although it dwindles in quantity in individual contexts with distance from Cuzco (see Chapter 1), it is

found throughout a huge area. On balance, I think that it was made in the Cuzco area, and I think it unlikely that a large number of potteries were involved. Some of the manufacturing methods, and the scale of production, seem to have been new to this part of the Andes: but on the coast, the large-scale production of high quality wares, using a wide range of techniques, had a long tradition. Some of the coastal techniques can be recognised in the Inca pottery from Cusichaca. Donnan (1965) describes piecemeal assembly, and the use of strips of clay to lute parts of a pot together, for Moche pottery. Burger (1967) amongst others, has traced Moche influence (albeit stylistic) into the Chimu ceramic repertoire; and the archives refer to the re-location of northern coastal potters by the Incas (e.g. Espinoza 1973). The coastal potteries would have provided an appropriate model for the Inca, with their requirement to supply a new, large and growing population with high quality pottery. The Imperial pottery may have been distributed in new ways, and perhaps for some new, peculiarly Imperial reasons: a deliberate strategy to impress, to signal the Imperial presence, to confer or confirm prestige. Morris (1978, 323) refers to the movement of "state" pottery along "politically important lines" (and see Bawden and Conrad 1982, 45, 95, 96). As can be seen from the Cusichaca evidence, it was also distributed in quantity across the Imperial frontiers; it is found in Cusichaca in contexts which do not provide good, independent reasons for thinking that it was considered highly prestigious or special in any way (apart, perhaps, from its absence on Q4-1).



On Q2-1, the Inca and Inca-influenced pottery is associated with wares which had appeared much earlier in the sequence; and with wares which are new in the sequence and which bear no formal or stylistic resemblance to Inca pottery. And it seems plausible that this proliferation relates directly to new economic possibilities afforded by the existence of the early Empire. New markets opened up: both new and traditional ceramic industries found outlets amongst the multifarious populations of the Empire, and obviously beyond its political or military frontiers. This is not to say that free markets existed, or that the distribution systems for all the wares was the same (see, e.g. Fry and Cox 1974): it is possible that each ware was distributed in a different way (compare modern trade, Appendix 6). Some industries were clearly new: those producing Ware 13, for example. Others were probably new (e.g. Wares 1, 12 and 23); it seems economically reasonable for new industries to specialise, particularly in the face of competition. Tempering of fabrics, appearing now for the first time in the Cusichaca sequence, suggests, too, that consumer demand was outstripping the availability of naturally suitable clays. But traditional wares continued to be a part of the assemblage, resistant to change because, obviously, still in demand. Other wares, new in the sequence, but with a more traditional stylistic appearance, became available because of the general economic stimulation, but whether this implies a change in traditional marketing strategies or some new phenomenon, depends upon good chronological evidence from sites nearer to, or in, the area of origin.

An appropriate parallel exists in Roman Britain. In the early years of the occupation, pottery industries proliferated. New, long-distance trade links were set up, new industries began, and old ones were stimulated (e.g. Fulford 1977; Loughlin 1979, 124 and discussions; Rigby 1977, 41). There were now new categories of consumers, such as the army, and supplies of utilitarian pottery from many industries reached the forts, some being traded long distances, sometimes riding piggy-back on the fine ware trade. As I have said, it is impossible to tell from this unique and limited evidence in Cusichaca whether any changes had occurred on site which made this augmented assemblage appropriate, or whether, simply, freedom of choice had been given a larger scope. But it is significant that this body of evidence, whatever its rationale, here pre-dating the formal Inca occupation and beyond the Imperial jurisdiction, recurs in identical form in Inca contexts.

The Inca 1a soils on Q2-1 contain pottery which must have been already on the site (compare the sterile Inca 1a soils on Q1). So the 'new' wares, 21, 26, 39 and 71 can be added to the list discussed above: logically, all of these belong to the pre-Inca 'influx'.

In pottery terms, the actual Inca occupation in Cusichaca would pass unnoticed. The assemblage on Q2-1 remains the same from the latest pre-Inca buildings and terraces through INCA II, IV and into the last phase of occupation, with only rare new things appearing. Whatever trade networks were established before the Inca occupation,

therefore, remained viable to the end of the Late Horizon period (see Franch 1968).

Cusichaca is overhung by precipitous mountains, which seem to isolate the valley. In this environment, trade networks of any kind, let alone the numerous, long-lasting and busy ones which I describe, are difficult to imagine. But the modern population is constantly on the move in all directions, fetching and carrying (see Appendix 6); and Cusichaca was included in an extensive Inca road- and track-way system (Kendall 1985, 188-224, 244-45; Drew and Kendall forthcoming), some parts of which may have had pre-Inca origins. The isolation is only an impression.

The convenient division of the Inca presence amongst five sites means that different 'strategies', using the same basic ceramic assemblage, can be distinguished; although whether these distinctions would carry into other areas, or could be recognised within areas of one single site, remains to be seen. I think that to try to interpret the different ceramic assemblages within each site in terms of 'function' or activity, is not profitable; no correlations can be found with the architectural groups which Kendall has provided with functional equivalents; and I think that too many other variables operated on a personal, domestic level (compare the "differential accumulation of possessions", metallic in this case, in Chapman and Tylecote 1983, 375).

This process of turning the 'provincial Incas' into an archaeological culture is attended by the same kinds of study problems which accompany Roman studies in Britain. The problem of synthesising different kinds of evidence is the same; the more evidence one adds, the more blurred becomes the picture. Both Romans and Incas are recognisable architecturally, and both are historically recorded. But add archaeological evidence, particularly ceramic, and the imperial frontiers break down a little, because one is dealing with a more mundane and traditional sub-stratum of economic activity. For both Romans and Incas, it is difficult to make comparisons with previous cultures, partly because the evidence is more restricted for the 'pre-Romans' and 'pre-Incas', and partly because the empire builders often had a catastrophic effect on their predecessors' remains. And, in both cases, it is equally difficult to identify a contemporary society which was untouched by the attributes which are used to recognise the imperial presences. The obvious comparisons end there. The pottery of the Inca Empire in the provinces can be used to look at a piece of economic behaviour. But to put this into perspective, to recognise how pottery may have been used by the Incas as part of a deliberate (non-economic) strategy, and to see how such strategies affected consumers in the provinces, one needs the comparison with the situation in the Late Horizon period in the Inca capital.

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NOTE: 'Chronicles', 'archives' or 'records': documents compiled in Spanish in the years following the conquest. Time has not permitted my reading the original texts, very few of which can be taken at face value. Therefore, I have relied on syntheses such as those by Bankes (1977), Julien (1982), Kendall (1984), Menzel (1959; 1976), Murra (1956) and Rowe (1944; 1962; 1963a and b; 1967; 1982), and on the translation by Livermore (1966) of de la Vega (1604).

## APPENDIX 1-1. Descriptions of wares

"What today counts as an observed concomitant of a phenomenon will tomorrow be used to define it" (Wittgenstein 1958).

### Introduction

The descriptions of the wares are based on the analyses of their component parts (Appendix 2), and on the results of experimental and ethnographic work (Appendices 3 and 6). For the shape and decoration codes, see Appendices 4 and 5. Functions are discussed above in Chapters 4 and 6, and distributions off-site in Chapter 7 and Appendix 8. Sources of raw materials and/or places of manufacture are discussed in Chapters 4, 6 and 7, and in Appendix 3. Chronological and spatial distributions on the lower Cusichaca sites are shown in Charts A to M and Z.

The descriptions have been organised in the following way, using Peacock's system for the fabric descriptions (1977, 27-33):

WARE (number): short general description.

Description of the fabric.

Raw materials: 1. Type of clay and geological provenance, natural contents; type of temper.

Processing: 2. Cleaned/washed; addition of temper.

Appearance of fired clay matrix of fabric (hand specimen):

3. Colour of outer surface (+), core, inner surface  
(1) (fully oxidised colours unless specified);

hardness; appearance of fresh fracture; homogeneity and texture.

Appearance of non-plastic inclusions (hand-specimen):

4. Quantity; sorting (i.e. gradation in size of particles); sizes of particles; distributions and orientations of particles in matrix; shapes; colours.

Petrological identities (thin-section):

5. Temper or major components; other significant components, and whether clasts or grains, in order of decreasing quantity; (accessory or variable components, in decreasing order of quantity.

Manufacture and firing:

6. Manufacturing methods; organisation of work; quality of workmanship.
7. Shapes. Illustrated unless specified.
8. Decoration: pigment consistency and application; tonal contrasts; scale and organisation of designs see illustration in 7).
9. Finishing techniques; order of work; appearance of surfaces.
10. Firing; appearance of clay, slips, in cross-polarised light as an indication of firing temperature; any other clues as to temperature; intended firing conditions.

Post-manufacturing topics:

11. Functions: smudging from cooking fires, contents



etc. (Chapters 4, 6).

12. Distributions of ware beyond lower Cusichaca (Chapter 7 and Appendix 8). Commonly-used name of the ware itself, of the shapes or painted styles, as recorded by others.

13. Place of manufacture (Chapter 4 and Appendices 2, 3, 6).

The characteristics listed above are not tabulated or quantified here. Although easier to read, this would have entailed some simplification, particularly in the fabric descriptions, thus suggesting similarities which are not significant. Those which are significant are discussed (and tabulated) in Chapter 4, in Chapters 6, 7 and in Appendix 1-2. Petrological quantities, size distributions of particles, colours, and matrix hardness, have been quantified (point counting: see Appendix 2; Munsell: see Appendix 5; and Moh), and the data are in the archives of the Cusichaca Project, held by myself, by Dr Kendall, and by the Instituto Nacional de Cultura, Cuzco and Lima.

Fabrics 18, 19, 20, Samples 328 to 380, and Sample 425 have not been studied. The fabrics are associated with pottery of 'Early Horizon' type (called Marcavalle and Chanapata/Pacallomogo in off-site contexts) and they are lumped together as 'E.H.' in the charts. Samples 328 to 380 are associated with unique wares found only on Q2-2 (see Chapter 7), and they have not been included in the study. Sample 425 occurs on Q2-2 and in Q2-1 and is included, but without

further analysis, in Chart Z and in the discussions in Chapters 6 and 7 (see also Appendix 8). All omitted numbers herein belong to the wares from Q2-2 or to the 'Early Horizon' wares which have not yet been fully studied.

The distinction between 'Ware' and 'Sample' is that of quantity of information. Sample 24 consists of body sherds only; Sample 126 is represented by a few very tiny sherds, all from on or near rims; Sample 155 has not been thin-sectioned, and the sherds are tiny, none from rims; Sample 176, although well-known off-site, is present here rarely, and only in small fragments; for Sample 400 there are numerous sherds, but rims, bases and handles are very rare and very small.

WARE 1. Simple utilitarian pots, with thin-walled bodies, made from a coarse untempered fabric. Outer surfaces smooth, with a greasy feel. Form A is typically black (+), from carbon absorbed during use.

1. River clay with natural granitic inclusions.

2. Cleaned.

3. Dark red-brown; medium/hard; rough fracture; fibrous texture, some elongated lacunae.

4. Very abundant; unimodal, from sub-microscopic (i.e. clay grade) to c.3mm; even distribution, random orientation; milky-white, yellow-white.

5. Granitic clasts; grains of quartz, feldspar, micas; sub-angular to rounded; (epidote, amphibole, chert, metasediments).

6. Coiled: continuous process from basal 'plate' to rim; upper coils bonded to inside of lower, scratched for ease of bonding; rims attached separately, not pinched (plate 1b); pulled handles, not plugged.

7. Appendix 1-3, figs. 1a, 1b; plate 1a).

A;

C (rare);

F (rare).

8. On A only:

B22 rare, and rarely visible: plate 1a).

C2: 'snake' cordons on shoulder or lower body (very rare).

C15: stamped circles round shoulder, or on lower body (rare).

C15: small oval lug, indented, on shoulder (one example only).

9. Wiped (1) as work proceeds; body scraped, wiped, and self-slip applied, coating surface grains; slip not polished, but dries with very low natural gloss (plate 1b). B22 polished.
10. Clay anisotropic; oxidised.
11. Food residues (1) common in A, as is smudging (1) (plates 1a, 1b). The shape is suitable for a cooking pot (lack of sharp angles: Woods 1983/4, 25ff). Pots of these sizes/shapes made and used for cooking nowadays (compare Ware 8: plate 3).
12. Coarse pots of this type are commonly referred to as low-grade, Inca-period cooking pots, but they are not necessarily always the same ware.
13. Unknown.

WARE 4. Undecorated pedestal pots with thin-walled bodies. Very well-made, in a medium-coarse, untempered fabric.

1. River clay with natural granitic inclusions; tempered with occasional fragments of grog.
2. Well cleaned; grog added.
3. Dark red-brown; medium hard; rough fracture; homogeneous, slightly grainy texture (plate 2a).
4. Common to abundant; unimodal+ from clay grade to c.1.00mm; even distribution, random orientation; milky-white, (dark red, black) (plate 2a).
5. Grog: occasional small pieces of an andesite-tempered ware (?Ware 13); granitic clasts: dark veined, sub-rounded; quartz, quartzites, feldspars, micas, metasediments; (opaques, amphibole, epidote, mineralised grains, natural clay pellets).

6. Piecemeal manufacture: three major segments (lower body, upper body plus rim, and pedestal) welded together after drying out (plate 2b). Fillets of clay (1) to span joins. Handles pre-formed, not plugged (plate 2c).

7. (Appendix 1-3, fig. 2; plates 2b, 2c).

E (with lids: rare; plate 2d).

(A: compare fig. 1a. Very rare).

8. B22

B9B on handles, upper bodies (rare).

C2: snake cordons opposite handles (rare).

C15: oval lugs, indented, on shoulder opposite handles (rare)  
(compare Ware 1).

9. Wiped (1), (+) (tiny birefringent mineral grains concentrated (+) under slip); fine self-slip applied (+), which dries with natural gloss (plate 2b); B22 and B9B polished; surfaces exceptionally smooth and twinkling.

10. Anisotropic clay; oxidised.

11. References in the literature identify this as "the Inca cooking pot" (Julien 1981; Meyers 1975). Food residues were found in Sacsahuaman examples, but rarely (?never) outside Cuzco (these pots are found in Late Horizon Period VIP burials in Ica, see Menzel 1976). Fabric suitable for cooking, but shape, perhaps, too angular. Secondary uses of pedestal after breakage very common here, to judge from wear marks.

12. With Ware 13, Forms H and J, the most widely distributed ware during the Late Horizon Period.

13. Unknown.

WARE 6. Undecorated simple pots, well made from a fine untempered fabric.

1. River clay with small natural inclusions.
2. Well cleaned.
3. Buff-brown; medium hard, but with a brittle quality; slightly rough fracture; dense, homogeneous.
4. Common; unimodal, from clay grade to <1.00mm (rare); even distribution, random orientation; chalky-white.
5. Quartz, quartzite, feldspars; (mineralised grains, amphibole).
6. Manufacturing process not known.
7. (Compare Appendix 1-3, figs. 1a and 2).  
?A;  
E
8. B22.
9. Well wiped; no slip; B22 polished.
10. Anisotropic clay; oxidised.
11. Unknown.
12. Unknown off-site. A general resemblance to Late Horizon Period utilitarian wares (e.g. Wares 1, 4, 12, 23).
13. Unknown.

WARE 8. Simple utilitarian pots with thin-walls, made from a coarse tempered fabric; part-glazed bodies, multiple handles.

1. ?River clay with some natural inclusions; slate temper.
2. Cleaned and washed; coarse-crushed slate added.
3. Very dark red-brown; medium hard; laminar fracture; fibrous, with some elongated lacunae.

4. Common; ill-sorted, with natural inclusions from clay grade to <0.5mm: temper from c.1.00-1.5mm; even distribution, lanceolate temper parallel to surfaces; natural inclusions all colours: temper dark.
5. Slate temper: lanceolate fragments of crushed, fresh rock; weathered andesite, quartzite, quartz, part-mineralised feldspars, sandstones; (epidote, amphibole).
6. Coiled from base upwards: compare Ware 1.
7. (Appendix 1-3, plate 3).

A

- 3-4 thin, vertical strap handles from rim to shoulder.
8. Dark green bubbly glaze, splashed on rim, upper body.
9. Wiped; slurry or self-slip applied pre-glaze, coating surface grains, producing a greasy texture.
10. Isotropic clay; biscuit kiln firing to c.700° pre-glaze; second kiln firing to 1000°+ for glaze (local informants); oxidised.
11. Used as a cooking pot.
12. Sold through weekly markets and fiestas nowadays, and distributed all over the Cuzco region. Limits of distribution not known, but certainly as far north as Quillabamba (see Appendix 6).
13. South Altiplano; more than one factory referred to by informants, all in Puno area (see Appendix 6).

WARE 9. A limited range of very uniform, very well-made pots of Cuzco-Inca shapes (see Ware 13). Heavy, solid, made from a medium-coarse untempered fabric, with simple coloured washes as decoration.

1. A (slightly) carbonaceous river clay, with natural granitic and metasediment inclusions.

2. Very well cleaned and mixed.

3. Dark red-brown; grey-brown unoxidised cores and (1), (according to shape and amount of paint/slip); hard; rough fracture; dense, homogeneous (plate 4).

4. Common/abundant; unimodal:— from clay grade to 1.5/2mm; even distribution, random orientation; all colours, predominantly milky-white (red, black) (plate 4).

5. Weathered granitic clasts; metasediments; granitic derivatives: quartz, feldspars, micas; mineralised grains; opaques; (lavas, cherts, epidote, amphibole, micas).

6. Piecemeal manufacture (see Ware 13 and Appendix 3): major segments are bonded together after drying out; whole procedure carried out with care: coils very well bonded, smoothed (plate 4).

7. (Compare Appendix 1-3, figs. 3a, 3b, 3c; plate 6b).

(B)

H

J

K

8. B5A, 5B

(B6)

B9B



B22

B23

B24

Simple washes of colour or wide bands, emphasising major parts of forms (e.g. neck, upper body) or following predominant curvature (e.g. wide horizontal bands inside Form J); thick paint, multiple brush strokes; colour contrast medium; most pigments have a dusky hue, from partly-unoxidised bodies.

9 Well wiped as work proceeds; thin self-slip (+), underlying pigments: dries with a low natural gloss; white and black pigments compacted, but little/no gloss; red pigments polished; surfaces exceptionally smooth and twinkling.

10. Anisotropic clay, isotropic self-slips and paints; oxidising conditions, but complete oxidation sometimes inhibited (see 3, 8).

11. No residues found. Forms B and H are suitable for carrying, storing (and perhaps fermenting) liquids.

12. Pots of identical shape (but not necessarily in the same ware) are found all over the Inca Empire during the Late Horizon Period, and are normally called 'provincial' or 'local' Inca: in Cusichaca these examples are identical in shape and manufacturing methods to Ware 13.

13. Unknown.

WARE 11. Simple (jars), bowls and plates, poorly made in a coarse fabric, with medium-thin walls; pale surfaces with dark red paint.

1. River clay with natural quartz sand (and granitic) inclusions.

2. Cleaned.
3. Bright, pale orange-pink; medium hard; smooth/slightly laminar fracture; thick, dense (plates 5a, 5b).
4. Common; unimodal:— from clay grade to 1-2mm; evenly distributed, random orientation; predominantly white.
5. Occasional granitic clasts; quartz and feldspar grains; porphyritic lavas; (trachy-syenites; sandstones; micas).
6. Coiled from the base upwards; coils are poorly bonded together and surface undulations not smoothed (plate 5a).
7. (No illustration).

B

(C/K)

(J)

No complete examples.

8. B5A, 5B.

A thick creamy-yellow slip (plate 5b), carrying very dark red pigment in wide bands at rim, on neck; pigment streaky.

9. Surfaces wiped; slip polished (deep tool marks), to a leather-like finish; spalling common, and slip usually covered with a network of fine cracks (plate 5b).
10. Anisotropic clay; oxidation complete.
11. No indications.
12. No indications: general similarity to Ware 9, Ware 13 shapes (see Appendix 1-3, figs. 3a, 3b, 3c); pots such as these are usually identified as 'provincial' or 'local' Inca.
13. Unknown.

WARE 12. Ill-made utilitarian pots with medium-thin walls, rare and simple decoration; made from a dark, coarse, untempered fabric.

1. River clay (carbonaceous), with granitic/quartz inclusions.
2. Cleaned.
3. Dark red-brown; a carbon layer under surfaces is very common; hard; laminar/rough fracture; homogeneous.
4. Abundant; unimodal:- from clay grade to c.2mm; even distribution, random orientation; predominantly white: clastic inclusions have a 'chalky' appearance, and present flat faces in fracture (unlike Ware 11). This is a very distinctive characteristic.
5. Weathered granitic clasts; quartz, feldspars, sandstones; micas, metasediments, opaques: rounded to sub-angular; (andesite fragments).
6. Coiled from the base upwards; coils poorly bonded and smoothed, and walls of uneven thickness; rims made by adding a thick fillet of clay (+) to the uppermost neck coil: cracking and separation at this junction very common.
7. (Compare Appendix 1-3, figs. 1a, 6a).

A

(B)

(C)

No complete examples known. Irregularity of profiles means that it is difficult to estimate sizes, or the consistency of shapes/sizes; rare pointed or pedestal bases (cf Form E) on A; wide (4cm) strap handles.

8. B22

B23

C15: rows of stamped circles (rare) (cf Ware 1).

9. Walls are wiped and given a 'wet hand' finish; surfaces dry matt, but with a very distinctive slippery, greasy feel; occasional scribble polish.

10. Anisotropic clay; oxidising conditions.

11. Food residues present; variable smudging (+), presumably from use over an open fire.

12. Not known off site.

13. Unknown.

WARE 13. A limited range of very well-made and decorated pots in a tempered fabric; shapes and decoration conform to those described by Rowe for classical Cuzco Inca wares.

1. (River) clay with occasional natural granitic inclusions; fresh andesite temper.

2. Cleaned by sieving, and washed; andesite crushed, added.

3. Rose-pink; unoxidised cores and (1) common in closed shapes, and (+) under paint or slip; hard; rough fracture; homogeneous, dense (plate 6a).

4. Common; ill-sorted: a matrix of very small, natural inclusions, none larger than 0.25mm; andesite inclusions are 0.75-c.1.00mm; evenly distributed, but mica concentrated on some surfaces (see 9); some preferred orientation of temper parallel to walls; natural inclusions white, red, twinkling; andesite dark to medium blue-grey (plate 6a).

5. Andesite temper: lanceolate, uniform in size and appearance; quartz grains, feldspars, micas; (natural clay pellets).

6. See Appendix 3: major segments are coiled individually, bonded together after drying out, with fillets of clay to span joins (fig. 3a); very well-made, with coils well-bonded and smoothed (plate 6a). Handles and lugs are shaped before attachment: not plugged, but attached to a scraped surface. Rowe (1944) refers to mass production.

7. (Appendix 1-3, fig.s 3; plate 6b)

(?B)

C

H

J

(L)

All walls of comparable thinness, regardless of pot size; uniformity in rim and handle shape across the range; a small number of sherds suggest that the original range in Cusichaca may have been greater (fragments of lids, a rim with lid seating (1), a flat base with vertical walls above, a small omphalos base).

8. The salient characteristics of the painted decoration are: thick pigments; a medium to high tonal contrast (the dusky hue referred to by Menzel (1976, 68) and the "typically dark appearance" mentioned by Kaufmann-Doig (1978, 725) derive from incomplete oxidation of either the underlying surface, or of the pigments themselves (see Appendix 2)); division of the pot into major decorative fields according to its shape: characteristically, horizontal bands on necks, vertical on

bodies, cruciform (1) on open shapes, with horizontal bands at the rim; within the major fields, a strong diagonal element: triangles, lozenges, netting designs of diagonal bands or lines, etc.; designs built up from small-scale elements, multiplied in number rather than enlarged to cover larger areas; designs are geometric: no cursive, free-hand or curvilinear work on these examples. Despite richness of appearance, little originality is required to produce such repetitive designs. Baca (1971), Kaufmann-Doig (1978) and Menzel (1976), amongst many others, provide fine illustrations of individual designs and of the complete, decorated pots.

9. All surfaces wiped, horizontally on bodies, vertically on necks; all surfaces covered with a thin, very fine-textured self-slip (enhanced mica content in skin which forms slip), well-compacted (plate 6b); coloured slips polished, usually with a scribbling technique, to a high/medium gloss; pigments not polished: white compacted, and sometimes blacks and reds, but no high artificial lustre.

10. Anisotropic clay; isotropic slips, paints; oxidised, but slip, paint, and shape often inhibit complete oxidation.

11. H, the 'aryballus', can be carried on the back conveniently, and the handles/lug are arranged for this (see, e.g. illustration in Kaufmann-Doig 1978, 726). The narrow neck implies liquid contents; the pointed base and shallow basal flare are suitable for bedding the pot into uneven floors and keeping contents cool. If then tipped forward to pour, the swell of the lower body acts as a sump for contaminants. Imbedded bases of

Ware 13-H and Ware 9-H have been found in Cusichaca. None of the Cusichaca examples of any shape have surface smudging or contain burnt residues. Miniature and paired pots (Forms H and J) are recorded from burials elsewhere (e.g. Sacsahuaman: Julien, forthcoming); 90% of the pots found in the storehouses at Huanaco Pampa were Form H, although not necessarily in this ware (Morris 1972).

12. Distributed throughout the Inca Empire: Forms H and J in particular. Rowe refers to this ware as one of the prestigious 'symbols' of Inca competence and influence. Murra, quoting Acosta (1590), refers to "Inca pottery", *inter alia*, as one of the products of "proper and special artisans" (1956, 255). (See Ware 29, note 12).

13. See Appendix 2. The origin of the clay is unknown; andesite outcrops mainly to the south of Cuzco. Tradition identifies both Raqchi and San Sebastian in Cuzco (see Rowe 1963, 243) as the sites of Inca pottery factories.

WARE 15. Thick-walled pots of unknown shape, made from a tempered fabric, and painted with rectangular designs.

1. (River) clay with natural granitic inclusions; (fresh) andesite temper.
2. Cleaned by sieving, (?washing); andesite crushed, added.
3. Rose-pink, orange-pink: characteristically not fully oxidised; hard, rough fracture; homogeneous; dense.
4. Common; ill-sorted: a matrix of small, natural inclusions, few larger than 0.25mm; andesite fragments c.1.00mm, lie parallel to

surfaces: even distribution; natural inclusions white, red, black; andesite, dark grey.

5. Andesite temper: lanceolate; quartz grains, feldspars, micas; (natural clay pellets; amphibole; pyroxene). Identical in all respects to the fabric of Ware 13.

6. Coiled. No other evidence.

7. (Appendix 1-3, fig. 4).

Thick-walled body sherds only.

8. B3A/C: thick paint, applied in medium/large-scale four-square designs, with no diagonal elements; low tonal contrasts.

9. Wiped casually; self slip (+), then painted, the whole vigorously polished: a carved appearance, sometimes with a crackled surface, and a low/medium gloss.

10. Anisotropic clay; thick, isotropic slips; oxidised, but incompletely.

11. No surface smudging or residues.

12. See Appendix 8: not identified in collections north of Cuzco, apart from Cusichaca; but so-called 'Lucre' sherds from the Pikillacta/Lucre basin are identical. Barreda (1973) considered 'Lucre' pottery to be intermediate in date/style between Killke and Inca; Rowe (pers. comm.) considers it to be only a decorative style, with pre-Inca precedents, occurring sometimes on true Cuzco Inca pots.

13. Clay source unknown; andesite outcrops south of Cuzco, in, *inter alia*, the Lucre basin.



WARE 21. Thin-walled, well-made bowls made from a medium-textured untempered fabric.

1. River clay with natural quartz sand inclusions.
2. Well cleaned.
3. Dark red-brown; hard; rough fracture; dense; homogeneous.
4. Common/abundant; unimodal: from clay grade to <1.00mm; even distribution, random orientation; predominantly white.
5. Grains of quartz, feldspars; (micas; amphiboles; sandstones; metasediments). Similar to fabric of Ware 9, but a systematically finer texture.
6. Coiled from a flat base plate: base/wall partings common. Well-bonded coils.
7. (Appendix 1-3, fig. 5).
- K.
8. B9B
- B22
- B23.
9. Wiped; a fine micaceous self-slip applied all over, which dries with a natural gloss; coloured slip polished with a scribbling technique.
10. Anisotropic; isotropic slips; oxidised.
11. No smudging or food residues.
12. Unknown distribution off-site. Similar in all ways to Ware 9, but thinner walls, finer textured fabric.
13. Unknown.

WARE 23. Very thin-walled jars and globular pots, undecorated, made from a tempered fabric.

1. (River) clay (carbonaceous), with natural granitic inclusions; slate (?and mica schist) temper.
2. Cleaned and washed; temper crushed, added.
3. Buff-brown to pale salmon-pink; medium hard; laminar fracture; fibrous, with elongated lacunae.
4. Abundant; ill-sorted: common natural inclusions from clay grade to 0.5mm; abundant temper c.1.00mm; even distribution, temper lies parallel to surfaces; white, semi-transparent and schist-like, and dark.
5. Slate temper: lanceolate; mica schist: oval in plan, flat; quartzites, quartz, feldspars, mineralised grains; (basaltic material, metasediments). Compare fabric of Ware 8.
6. Coiled: coils are poorly bonded and smoothed; walls undulate.
7. (Appendix 1-3, fig. 6).

A

(B)

Thin strap handles, pulled into shape from rim to shoulder; (horizontal or skewed handles on bodies).

8. None.
9. Surfaces wiped.
10. Anisotropic; oxidised.
11. Food residues are found (1) in A, and surface smudging (+) common; fabric texture/wall thinness, and shape, suitable for cooking (compare Wares 1 and 8).

12. Sherds of this ware identified as 'Colla Inca' by Valencia (pers. comm.), said to be of Late Horizon Period date, and from the Altiplano. (See Appendix 8, and compare Ware 8).

13. Unknown: see above.

WARE 24. Large, thick-walled pots, made from a coarse, untempered fabric, painted with simple bichrome designs.

1. (River) clay, slightly carbonaceous, with natural inclusions of many types.

2. Cleaned.

3. Bright orange; black, unoxidised core, or layers of carbon trapped under surfaces, are common; medium-hard; laminar fracture; fibrous, with lenticular vesicles.

4. Abundant; unimodal:— from clay grade to c.2-3mm; fairly even distribution, random orientation; all colours, but predominantly dark.

5. Predominant inclusions are dark, veined metasediments, sub-angular or oval, all sizes; altered granitic clasts, quartz and feldspar grains, mineralised grains, red and black opaques.

6. Coiled from base; rims thickened by adding a fillet of clay (+), or folding over the top coil; necks and bodies squeezed into shape, and finger and hand prints common.

7. (Appendix 1-3, fig. 7).

M

N

8. B3A, 3C

The contrast is very low, because pigments have sunk into the surface; simple, large-scale designs, with occasional zoning (horizontal on necks, vertical on bodies); more often, a vertical lay-out beginning at the rim, with strong diagonal elements (netting, triangles, lozenges); wide, multiple brush strokes in watery pigment; rarely, small areas of grey pigment.

9. Surfaces wiped; on undecorated surfaces, a self-slip; slips and pigments polished: deep, wide, polishing facets give a carved appearance and produce a low lustre; slips are covered with fine cracks, and have sometimes spalled.

10. Anisotropic; oxidised, but often incompletely.

11. No food residues, no smudging.

12. This ware is unknown off-site. The style of decoration is similar to that of Cuzco Killke designs, and shares their "characteristic carelessness" of execution (Rowe 1944,49).

13. Unknown.

WARE 26. Well-made pots in shapes which conform to the Cuzco Inca prototypes in all ways. Made from a pale-firing, tempered fabric.

1. (River) clay with occasional natural (granitic) inclusions; andesite temper.

2. Well-cleaned, (?washed); fresh andesite crushed and added.

3. Pale rose-pink; hard; rough (laminar) fracture; dense, homogeneous.

4. Common/abundant inclusions; ill-sorted. natural inclusions from clay grade to 0.25/0.5mm; andesite inclusions c.1.00mm; even distribution, andesite parallel to walls; natural inclusions are

white and red; andesite a pale blue-grey.

5. Andesite; lanceolate: colour systematically lighter than in Ware 13; feldspars, micas, clay pellets; (quartz). Fabric similar to that of Ware 13, but a slightly less clean matrix, and appearance of major components different.

6. As Ware 13.

7. (Compare Appendix 1-3, fig. 3).

As Ware 13, but predominantly open shapes, J and K.

8. As Ware 13: but these pigments are brighter and clearer; less paint used: more open, undecorated areas.

9. As Ware 13, but the self-slip from this clay is less micaceous, and dries a pale cream-pink colour.

10. Anisotropic clay; isotropic slips and paints; oxidised.

11. No food residues, no smudging: see Ware 13.

1. In most respects, this ware is identical to Ware 13. It differs most in its fabric having a less clean matrix, in the fully-oxidised clay colour and, in hand specimens, in the colour of the andesite temper, although no differences can be seen in thin-section. Clay and temper may come from another source. See comments on Ware 29; plate 7 is comparable.

13. Unknown, but see ware 13.

WARE 27. Well-made pots, simply decorated, identical to Forms (?H) and L in the Cuzco Inca series. Made from a pale-coloured, tempered fabric of a relatively coarse texture.

1. (River) clay with natural inclusions; andesite temper.

2. As Ware 26.

3. As Ware 26.

4. Abundant; ill-sorted: natural inclusions from clay grade to 0.25/0.5mm; andesite clasts c.1mm, rarely up to 2mm; even distribution, some preferred orientation in andesite; natural inclusions are white, red; andesite is pale blue-grey.

5. As Ware 26.

The major difference lies in the size and quantity of the andesite temper: here, there is more of it, and in larger fragments.

6. as Wares 9, 13.

7. (Appendix 1-3, fig. 8).

(H)

L

8. B20,

B22.

Examples of H are rare: paint is simple, like that of Ware

9. The paint on Form L is very restricted (see fig. 8), and the overall effect is extremely pallid.

9. )

)

10.) As Ware 26

)

11.)

12. Fabric colour, texture, resemble Wares 26 and 29, bar note 5 above. The size distribution of the andesite temper in each ware is distinctive.

13. Unknown. See comments in Ware 13 and other andesite wares.

WARE 28. Thin-walled pots with large-scale bichrome decoration, made from a bright-coloured, coarse, tempered fabric.

1. (River) clay with natural inclusions; andesite temper.
2. As Ware 26.
3. Bright pink-orange; hard; rough/laminar fracture; slightly fibrous, with lacunae; not well-mixed.
4. Abundant; ill-sorted: natural inclusions from clay grade to 0.25/0.5mm, evenly distributed, white, (red), grey; andesite up to 2mm, unevenly distributed, no preferred orientation, pale blue-grey.
5. Andesite petrologically similar to that of Wares 26, 27, but size distribution less consistent and the surfaces of fragments are weathered; feldspars, micas, pyroxene, amphiboles; (small granitic clasts; quartz; metasediments; epidote).
6. Coiled from the base upwards; coils poorly bonded, and walls undulate; rim construction: see Ware 24.
7. (Appendix 1-3, fig. 9).

**M**

**8. B24**

The paint is thin, watery, applied with wide brush strokes in a slapdash way: scale of designs large; pigment sometimes sinks in to surfaces, otherwise contrast is medium-high; little/no zonation neck/body (cf Ware 24): major fields are divided vertically, with some subsidiary horizontal divisions; in-filling designs strongly diagonal (zig-zags, netting, etc.); some individual elements.

9. (1) wiped. lacunae and hair-line cracks common (cf Ware 45);  
(+) wiped; paint applied; the whole polished, and deep polishing  
facets produce a characteristic rippling, leather-like surface  
with medium-low gloss.
10. Anisotropic; oxidised.
11. No smudging, no food residues.
12. Distribution of this ware off-site not known. Style of  
decoration similar to that of Cuzco Killke (cf Ware 24), which  
makes the tempering practice, using material similar to/the same  
as those of Wares 26, 27, particularly interesting (see Ware 29,  
note 12).
13. Unknown, but see Ware 13 et al.

WARE 29. Very well-made pots, conforming in shape to those of the  
Cuzco-Inca repertoire; made from a pale-coloured, tempered fabric.

1. (River) clay with natural inclusions; andesite temper.
2. Cleaned, (?washed); andesite crushed, added.
3. Pale rose-pink; hard; rough fracture; dense; homogeneous  
(plate 7).
4. Abundant; ill-sorted, from clay grade to 0.25mm for natural  
inclusions; andesite c.1.00mm; even distribution, andesite  
parallel to walls; natural inclusions white, red, grey,  
twinkling; andesite very pale blue-grey (plate 7).
5. Andesite: lanceolate fragments of porphyritic andesite,  
petrologically consistent, and different from all other andesite  
tempers; rarely, some of the temper fragments are trachy-syenite  
(as well as true andesite). in hand specimen, they are identical ;



feldspars, quartz, clay pellets, micas, opaques, trachy-syenites, metasediments (very small granitic clasts, quartzites).

6. As Ware 13.

7. (Compare Appendix 1-3, fig. 3).

H

J

K

8. As Wares 26, 27; large areas of smoothly polished, micaceous self-slip are common.

9. As Ware 13.

10. Anisotropic; slips, paints isotropic; oxidised.

11. as Ware 13.

12. See comments on Wares 13, 26. Distribution of this actual ware off-site is not known. In all formal ways it is identical to Ware 13 (cf Wares 26, 27). Its fabric is tempered (compare Wares 13, 15, 26, 27 and 28); fabric and temper colours resemble those of Wares 26, 27 and 45; petrologically, the andesite temper is unique, and another tempering material is present: cf Ware 45. These are suggestive similarities, but difficult to assess without stratified materials from, or nearer to, the places of origin (compare plates 6a, 7, 8a; and 10: see Ware 66 below).

13. Unknown: see Ware 13.

WARE 31. Thin-walled pots with bichrome decoration, made from a coarse untempered fabric.

1. Carbonaceous river clay with natural, very varied inclusions (but see 5 below).

2. Cleaned, (slightly).
3. (+) bright orange-brown; unoxidised core and (1): layers of carbon trapped under (+) surface; hard but brittle; rough to laminar; fibrous, with lacunae.
4. Abundant; unimodal:— clay grade to c.1.00mm; even distribution, random orientation; white, red, greys, black.
5. Rounded clasts of basaltic material, weathered granites, chert; feldspars, quartz, micas, metasediments; (zircon). (One inclusion of grog was identified, of the same fabric as the matrix: rarity argues against 'temper' per se: more likely to be a casual contaminant).
6. Coiled; coils poorly bonded, and walls undulate.
7. (Appendix 1-3, fig. 10)  
?M.
8. B3/4  
Wet pigment, applied quite thickly; medium tonal contrast; medium-sized designs; little/no zonation: major fields are vertical, (some horizontal banding on/below shoulder: rare) with subsidiary diagonal netting, zig-zags; some individual motifs, cf Wares 24, 28, (45).
9. (1) wiped, now much cracked; (+) polished or compacted before paint applied: faceted, pigment is matt, or has its own natural lustre.
10. Anisotropic.
11. No smudging from use, or residues.

12. Decorative style generally similar to that of Wares 24 and 28, i.e. to Cuzco Killke. Distribution of this ware off-site not known.

13. Unknown.

WARE 39. Large, thick-walled jars made from a medium-coarse fabric.

1. (River) clay with natural granitic inclusions; ?some granitic temper.

2. Cleaned; (?temper added).

3. Pale pink-buff; hard; laminar/rough; dense, homogeneous.

4. Abundant; ill-sorted: all types from clay grade to c.0.5mm. common granitic clasts and metasediments also from 1-1.5mm; all evenly distributed, random orientations; white, red, grey.

5. Weathered granitic clasts in distinctly larger size range: may be a natural component; (smaller granites, quartz, feldspars, clay pellets, mica.

6. Coiled.

7. (Appendix 1-3, fig. 11).

(?B)

No complete examples.

8. B22.

9. Wiped; top of rim covered with a thick self-slip: matt, a greasy feel, pigment applied, drying with a low natural gloss.

10. Anisotropic; oxidised.

11. No smudging or residues; shape and sturdiness may suggest 'storage jar'.

12. Not known off-site. Rim shape unique; abrupt angle changes at rim/neck, (?neck/shoulder) resemble Forms B or H in the Cuzco Inca repertoire.

13. Unknown.

WARE 40. Thick-walled, angular jars made from a pale brown, coarse, unique fabric.

1. (?River) clay with natural inclusions.
2. Cleaned.
3. Buff-brown; medium-hard; rough; dense, homogenous.
4. Abundant; unimodal:— from clay-grade to c.1.5mm; sub-rounded, rounded; even distribution, random orientation; white, grey, (red).
5. Most inclusions are sandstone clasts or derivatives: quartz, quartzites, micas; (feldspars, clay pellets).
6. Coiled: coils are poorly bonded.
7. (Compare Appendix 1-3, fig. 3a).

B/H

Other body sherds from pots of unknown, closed shapes.

8. (B22).
9. Wiped; extant paint slightly glossy; but little surface remains.
10. Anisotropic; oxidised.
11. No smudging, no residues.
12. Distribution of this ware off-site not known. Angular profiles at rim/neck and neck/shoulder junctions resembles those of Cuzco Inca prototypes closely.

13. Unknown. River clays deposited by streams draining off sandstone bedrocks upstream of Huayllabamba (Appendix 7, maps 1 and 7), do not resemble this fabric.

WARE 45. Medium to thin-walled pots, mainly jars, painted in watery mono- or bichrome, and made from a pale-firing, medium-coarse fabric.

1. River clay with multivarious natural inclusions; ?temper mainly trachy-syenite.

2. Cleaned; (?temper added).

3. Pale salmon-pink: core and (1) may be slightly unoxidised; medium hard; laminar/(rough); slightly fibrous, with lacunae (plate 8a).

4. Common/abundant; ill-sorted, from clay grade to c.0.25mm: 'temper' (see below) <0.5mm to >2.00mm: quantity and size distribution vary proportionately with wall thickness; all evenly distributed, random orientations; pale grey, pale blue-grey with black inclusions, (red, white) (plate 8a).

5. Weathered trachy-syenite clasts in all sizes: so-called temper is predominantly this: more rarely granite clasts or andesite: in hand specimen, all three look alike: irregular shapes, ashy grey colour, tiny black inclusions: (size distribution alone suggests tempering); trachy-syenite and granitic clasts, feldspars, quartz, clay pellets, opaques; (andesites, amphibole, epidote: a great variety of accessory rock fragments and mineral grains in the matrix).

6. Coiled; coils often poorly bonded and walls undulate, especially (1).

7. Appendix 1-3, fig. 12; plates 8b, 8c).

(G)

M

(H)

Numerous body sherds from pots of unknown shapes or sizes.

8. B2

B4

B6

B7

Pigment characteristically thin, watery, often sunk into surface (plates 8b, 8c); medium/low tonal contrast; ill-balanced combinations of large and small elements common: e.g. long, extenuated designs of very wide bands, edged with thin lines (plate 8c); scale and lay-out of designs variable. most typically, large areas are left unpainted, with simple geometric designs arranged diagonally or vertically from the rim (plate 8b); individual, freehand elements occur, but vary very much in size from pot to pot: e.g. large llamas, using multiple brush strokes (fig. 12c, 12e); identical motifs, but tiny, using three thin lines (fig. 12d); large, irregular blobs of paint, or tiny splatters. Clearly, a number of individual painting styles, many vigorous, most slap-dash, often refreshingly uninhibited by the actual shape or size of the pot.

9. Wiped (1): lacunae and hair-line cracks common, well-wiped (+), self-lip applied, firing a pale cream colour: some very pale surfaces seem to be unslipped (plate 8c): they may derive from volatilising of iron from surface during firing (see Mason

1971; observed too on a few test tiles); pigments applied; the whole polished, deep narrow polishing facets often producing a rippling, carved appearance and giving a soapy feel; cracking and spalling (+) common.

10. Anisotropic; true slips (and some pigments) isotropic; oxidised (sometimes incomplete on thicker-walled pieces).

11. Smudging from use, and food residues, absent.

12. See Appendix 8: distribution area includes Cuzco and to the north (see Ballon 1961), 183: Killke identified in Machu Picchu; Franch 1968, 428, refers to Killke in Chincheros); more sporadic to the south; shapes and designs resemble those of Cuzco Killke.

13. Trachy-syenite outcrops with andesite in Cuzco and to the south; also present in river clays from Ollantaytambo (see comments in Wares 26-29 incl. and Ware 66; compare plates 7, 8a and 10).

WARE 50. Very thin-walled pots of unique shapes, with simple monochrome designs, and made from a unique fabric.

1. (River) clay with natural inclusions.

2. Cleaned.

3. Very pale grey-yellow, not fully oxidised: oxidised patches are pale cream-buff; hard; laminar; fibrous.

4. Abundant; unimodal, from clay grade to 0.25mm; even distribution, random orientations; black, grey, (red, white).

5. A hyperbyssal rock comprising basalt-plagioclase, biotite, pyroxene: very altered; devitrified glass and vesicular lava

fragments, metasediment ; (quartz, mica, feldspars, chert, ?tuffs).

6. Coiled: coils very roughly smoothed (1), both surfaces undulate; pots pushed and squeezed into shape: finger-, hand- and tool-marks common.

7, (Appendix 1-3, fig. 13).

A small waisted pot, convex above and below the waist.

A deep rounded bowl with flat, horizontal handles.

Neither found complete, both lack sherds from rims or bases.

8. B6.

Watery, grey pigment applied over a pale yellow/cream slip, simple, small-scale designs, either linked rectangles made of narrow, uneven bands, or chevrons; lay-out (unusually) horizontal.

9. Self-slips (1), wiped, spalled; some compaction of slip (+); no polishing: surfaces are matt and feel gritty.

10. Anisotropic; oxidation incomplete.

11. No smudging from use, no residues.

12. Unknown off-site; the low tonal contrast of the decoration, the horizontally-organised designs and the pale fabric colour, resemble in general ways some examples called 'Huari utilitarian', others called 'Qotocalle' (neither authoritatively).

13. Unknown.

WARE 54. Robust jars and bowls made from a coarse, untempered fabric, painted with simple, large scale designs.



1. River clay with natural granitic inclusions.
2. Cleaned.
3. Medium to dark orange-brown: cores and {1} often unoxidised; medium-hard; rough fracture; grainy, homogeneous.
4. Abundant; unimodal:—from clay grade to c.1.5mm, evenly distributed, random orientations; milky-white, creams, greys, (dark grey, black).
5. No clasts: quartz, feldspars, micas; (mineralised grains, epidote, amphibole).
6. Coiled from the base up: coils quite well bonded, but some undulations.
7. (Appendix 1-3, fig. 14; plate 9).

(B)

M

M

Numerous body sherds from pots of unknown shape.

8. B1

B3

Decoration, if any, very simple, and usually large scale; watery pigment, sunk into surface; low tonal contrast; little/no zonation; single wide bands, usually vertical or diagonal from rim, irregular in width and alignment; some undulating bands; subsidiary in-filling elements: diagonal criss-cross bands, chevrons (plate 9).

9. Surfaces wiped; wet hand finish or self-slip (+), pigment applied; the whole compacted, pushing paint into surface, gloss low/very low: surface cracking common (plate 9).

10. Anisotropic; oxidised, but incompletely.
11. Smudging common on painted and plain jars; food residues occur, also on both.
12. Distribution off-site unknown. These pots have been called 'Killke-related' (e.g. Kendall 1976), but the resemblances are of a very general kind, and based only on a limited repertoire of geometric designs found on many wares. For all their simplicity, these pots are well-made, solid and heavy, and have a distinctive style.
13. Unknown.

WARE 55. Simple, medium-thin walled, undecorated jars and bowls made from a coarse, untempered fabric, with glossy surfaces.

1. River clay with granitic inclusions.
2. Cleaned.
3. Dark orange-brown: oxidation often incomplete; medium-hard, rough; dense, homogeneous.
4. Abundant; unimodal: from clay grade to 1.00mm; evenly distributed, random orientations; milky-white, cream; (greys, red, black).
5. Quartz, feldspars, micas; granitic clasts, mineralised grains; (sericite, epidote).
6. Jars coiled from the base upwards: well-bonded coils, some undulations; bowls are thumb-pots, with coiled rims.
7. (Appendix 1-3, fig. 15, compare fig. 14a).

K

M

8. None.

9. All surfaces are wiped; both surfaces of K, and M(+), covered with a thick self-slip, polished with vertical or horizontal strokes to a medium-high gloss, and resembling a chestnut in colour, shininess and texture.

10. Anisotropic; slip isotropic; oxidised, but incompletely.

11. No smudging, no residues.

12. Distribution off-site not known; resemblance to Ware 54 very close, but formation of bowls, and surface finish, are unique.

13. Unknown.

WARE 57. Robust pots in simple shapes, painted in bichrome, and made from a coarse, untempered, pale-firing fabric (Compare Appendix 1-3, figs. 16, 17).

1. As Ware 54.

2. Cleaned.

3. Bright, pale-orange pink; hard; rough; dense, homogeneous.

4.)

)

5.) As Ware 54

)

6.)

)

7.) (Compare Appendix 1-3, fig. 14)

8. E3

The designs are in red and black paint, and are similar in pigment consistency, scale, lay-out and content to Ware 54, although there is more variation here in line thickness (e.g. wide red bands edged with narrow black).

9. Surfaces wiped; paint applied; the whole compacted: lustre medium-low; surface cracking/spalling common.
10. Anisotropic; oxidised.
11. No smudging or food residues.
12. Unknown off-site. Similar in most ways to Ware 54, but their fired, fully-oxidised fabric colours are distinctively different, as are aspects of their decoration.
13. Unknown.

WARE 58. Simple, undecorated, thin-walled jars, with a distinctive finish, made from a coarse, untempered fabric.

- 1.)  
    ) As Ware 54
- 2.)

3. Very dark red-brown; unoxidised cores and (1), common; medium-hard; laminar/rough; dense, homogeneous.

4. )  
    ) As Ware 54
5. )

6. Coiled from the base upwards; coils poorly bonded, walls undulate.

7. (Compare Appendix 1-3, fig. 16).

B/M.

8. None.
9. Similar to that of Ware 55: this differs, being deeply faceted by the polishing, which produces a distinctive, carved appearance: polished surfaces are very dark.
10. Anisotropic, isotropic slip; oxidised, but incompletely.
11. Some smudging, possibly from use: no food residues.

12. Distribution off-site not known. Resemblance to Ware 54, 55, very close, but the fully-oxidised fabric colour, shape and finish are distinctively different.

13. Unknown.

WARE 66. Thick-walled pots with small-scale designs in thick pigment, made from a medium-coarse, pale-firing fabric.

1. (?River) clay with natural inclusions; (?temper).

2. Cleaned; (?temper added).

3. Pale buff-pink; hard; rough/(laminar); dense, homogeneous (plate 10).

4. Abundant; unimodal:— from clay grade to c.1.00mm; evenly distributed, random orientations; pale blue-grey, pale grey; red, white (plate 10).

5. Largest fragments: weathered andesite clasts, some trachysyenite, some granite, all rounded: sorting variable, so difficult to resolve tempering practice, if any; clay pellets, quartz, feldspars, micas; (chert, epidote, 'casual' grog of ?same ware, or an andesite-tempered ware).

6. Coiled: coils well-bonded, smoothed.

7. (Appendix 1-3, fig. 17)

(?M)

N

Numerous body sherds from closed shapes.

8. B4

The paint is characteristically thick and lustrous, and the edges of the pigments are slightly blurred: a faint, very narrow,

reddish tinge is visible on the surrounding surface; tonal contrasts high; designs are small-scale, neatly executed, predominantly linear geometri : orientation and lay-out not known; subsidiary motifs include netting, spots and, very typically, short lines.

9. Surfaces are wiped; visible surfaces covered in fine self-slip, very well-polished to a medium gloss, producing a smooth, slightly soapy feel; pigment applied, dries matt or with natural gloss.

10. Anisotropic, slips and paints isotropic; oxidised.

11. No smudging, no food residues.

12. Distribution of this ware off-site not known; design repertoire similar to that of Cuzco Killke, albeit smaller, neater. There is a general, visual resemblance to the fabrics of Wares 26, 27, 29, and petrologically, this fabric is comparable to those of Wares 29, (45) (compare plates 7, 8a).

13. Unknown: see comments on Wares 29, 45, *et alia*.

WARE 69. Medium-sized jars and bowls, poorly made in a distinctive, very coarse fabric, and painted carelessly in simple designs, usually monochromatic.

1. (?River) clay, (carbonaceous), with natural inclusions.

2. Cleaned.

3. Buff-pink; medium-hard; rough/laminar; fibrous, grainy (plate 11a).

4. Abundant; variable sorting, from clay grade to >2.00mm, fairly even distribution, some preferred orientation; 'chalky' white with black inclusions, white, black (plate 11a).

5. All weathered: largest clasts are very weathered granite, with black opaque inclusions; altered metasediments; chert, sandstones, quartz, feldspars; (clay pellets, amphibole, perthite).

6. Coiled: very wet clay, coils poorly bonded, edge to edge; walls and profiles undulate (plate 11a); finger- and hand-marks common.

7. (Appendix 1-3, fig. 18; plate 11b).

M

N.

8. B1/B2

(B4)

Pigment very thin and watery, carelessly applied with wide brush strokes; tonal contrast medium/low; designs usually large-scale, comprising bands/lines of similar width; designs on rims, upper necks, and bowls organised horizontally: vertical (more rarely diagonal) on lower necks, bodies; rare subsidiary, curvilinear motifs (plate 11b).

9. Tooling marks often visible; wiped cursorily (1); wiped, compacted (+), or on visible surfaces; paint applied, and sinks into surface: no subsequent polish (plate 11b).

10. Anisotropic; oxidised.

11. Food residues occur (rare); smudging (+) fairly common.

12. Distributions of the ware in surface collections off-site include: Q3 (comprising a significant proportion of the pottery there); from sites higher up the Cusichaca; and from the Limatanbo area of the Apurimac valley. Stylistically similar to Vares 24, 28, 54 et al., and thus to Cuzco Killke, but the similarities are of a very simple kind.

13. Unknown.

WARE 71. Well-made small bowls painted with black llamitos, and made from a very fine-textured red fabric.

1. )  
    )No thin-section.
2. )

3. Bright terracotta red; hard; smooth; dense, homogeneous.

4. No inclusions are visible to the naked eye but flecks of (biotite) mica.

5. No thin-section.

6. Coiled. coils very well bonded and smoothed.

7. (Appendix 1-3, fig. 19)

K.

8. B11

9. The surfaces are covered with a thick self-slip, polished to mirror-glossiness, and very smooth; on the inside surface, dozens of small schematic 'llamitos', painted in black with one thin brush stroke: paint slightly fuzzed at the edges.

10. Oxidised.

11. No smudging or food residues.



12. Distribution off-site not known. Style of decoration and general quality resemble those of some Cuzco Inca pottery.

13. Unknown.

WARE 73. Large, medium thin-walled jars, made from a unique, coarse, tempered fabric.

1. River clay with natural inclusions; temper from a metasedimentary rock source.

2. Cleaned, temper crushed, added.

3. Orange-pink: cores often slightly unoxidised; hard/very hard; rough/(laminar); dense, homogeneous.

4. Abundant; ill-sorted: natural inclusions from clay grade to c.0.25mm: temper from 0.5mm to 1.00mm; evenly distributed, randomly orientated; dark grey/black, white, grey.

5. Temper is rounded, mineralised, metasediments; small weathered basaltic and granitic clasts; feldspars, micas; (quartz).

6. Coiled: coils joined edge to edge, poorly finished (1), but well smoothed.

7. (Appendix 1-3, fig. 20).

B.

8. B22 (rare).

9. Wiped (+), (1); (+) covered in a self-slip, compacted: no lustre.

10. Anisotropic; oxidised, but incompletely.

11. No smudging, no visible residues. Shape and wall thickness may suggest 'storage jars' (compare Ware 39).

12. Distribution off-site not known; profile of lip, and sharp changes of angle in profile resemble Forms B, H in the Cuzco Inca repertoire (compare Appendix 1-3, fig. 3a).

13. Unknown.

WARE 74: this is an umbrella term used to cover all wheel-made, tin-glazed ('majolica') pottery. No formal study has been made of this here. Lister and Lister (1976, 1ff) and Vaz and Cruxent (1978) describe the introduction of such wares into the Americas from Europe soon after the conquest, and the setting up of New World factories. Tin-glazed wares are made now in Pukara, north of Puno (see frontispiece and Appendix 6), and the shapes and designs still resemble the European prototypes, as do the examples found in Cusichaca.

SAMPLE 24. Very thin-walled, undulating body sherds, often with a black or black/brown reduced outer surface; self-slipped, well compacted, and polished to a medium gloss, with a distinctive, ?decorative, scribbled polish over the top. The fabric is coarse, with abundant inclusions, identical in all respects to that of Ware 12, visually similar to some 'Early Horizon' fabrics, and to those of so-called 'Huari utilitarian' wares from Pikillacta (see Appendix 8). No reconstructable pots: curvature of sherds suggests large, globular bodies. The thinness of the walls and glossy reduced surfaces resemble some 'Early Horizon' wares, but the scribbling polish is distinct and different.

SAMPLE 126. Medium thin-walled sherds of small jars (?Form H), painted (B22), and made from a unique, tempered fabric.

1. (?River) clay with natural inclusions; temper from a ?metasedimentary rock source.
2. Cleaned, washed; temper added.
3. Cream-buff; hard; rough; dense, homogeneous.
4. Moderate/common; ill-sorted: natural inclusions from clay grade to <0.25mm: temper >0.25mm to 0.5mm; even distribution, temper orientated parallel to surfaces; dark red-brown, (white, black, red).
5. Temper is ovals of deeply stained, completely mineralised rock fragments, floating in a matrix of tiny feldspars, quartz, opaques and micas (cf Ware 26 fabric matrix).
6. Presumably coiled.
7. ?H.
8. B22.
9. Surface condition of sherds precludes study: extant B22 glossy, on a smooth surface.
10. Anisotropi , isotropic paint; oxidised.
11. No information.
12. Distribution off-site not known. The little of the shape that remains has a distinctively 'Cuzco Inca' look.
13. Unknown.

SAMPLE 155. Thin-walled body sherds made from a very hard, coarse fabric resembling that of Ware 24 in hand specimen, and with a greasy-textured, lustrous red-brown self-slip, coating surface

grains. Oxidation is incomplete. Shapes are ?open bowls and ?small jars. Occasional thin grey painted lines in netting patterns.

SAMPLE 176/348. Medium-thick walled body sherds, casually painted, and made from an andesite-tempered fabric.

1. River clay with natural inclusions; field nodules of andesite.
2. Sieved, washed; andesite crushed, added.
3. Buff-orange; hard (brittle); rough/(laminar); dense, homogeneous.
4. Moderate/common; very ill-sorted; natural inclusions from clay grade to c.0.25mm; temper c.1.00mm; even distribution, random orientation.
5. Temper is vesicular lava: uniform in angular shape and size of fragments: each clast has a glassy matrix containing fine-textured plagioclase and biotite needles; natural inclusions are quartz, sedimentary clasts, pyroxene, biotite.
6. Coiled; piecemeal manufacture.
7. (B).
8. B22  
B2B  
(B5)  
Simple, large-scale linear and curvilinear designs, in a thin, matt, crimson pigment.
9. Wiped: wet hand finish; paint applied; the slightly gritty surface texture is very characteristic.
10. Anisotropic; oxidised.

11. No smudging, no residues, but purpose known (see below): this particular shape is used to carry and store liquids.

12/13. Distributed all over the Cuzco region, and examples on sale in Lima. These fine wares are made now in Raqchi: the full range made there comprises other shapes, and occasionally more detailed decoration, but this shape, often with flower-like motifs, is the most widely distributed (see plate 3).

SAMPLE 400. Thick-walled body sherds, rounded or pointed base sherds, and neck/rim sherds from jars (B/M); rare painted decoration (B1, B9A), but face masks (C7) on jar necks relatively common; made from a coarse, untempered fabric of (carbonaceous) river clay, with weathered, medium/large granitic clasts and derivative crystalline grains. The fabric core is often unoxidised, but surfaces, covered with a characteristically matt, wiped self-slip, are a bright, clear, pale red-orange (plate 12). Distribution off-site not known; shapes and painted decoration resemble those of Ware 54, and the impassive, strong, modelled faces have counterparts in the Cuzco Killke repertoire (see Appendix 1-3, fig. 21).

APPENDIX 1-2. Major ware categories

According to the characteristics listed in Appendix 1-1, a small number of general categories can be defined: within each, the wares can be considered duplicates of one another although, lacking the evidence, this is not to say that they would/could have been used for the same purposes. This is merely a device to organise the information, which is described below, and presented in tabular form on p.196.

A (Painted) wares: non-Inca stylistic traditions:

A-1 Dark to medium-firing clays, untempered fabrics; large-scale, simple designs:

Wares 24, 54, (55), 57, (58), 969), Sample 400.

A-2 Pale-firing clays, (untempered) fabrics; medium to small-scale designs, resembling those of Cuzco-Killke:

Wares (31), 45, 66.

A-3 Unique, tempered fabrics: dark-firing, unique design: Ware 15  
medium-firing, designs as A-2: Ware

28

A-4 Other, untempered fabrics: Ware 50.

B Painted wares: Cuzco Inca stylistic traditions:

B-1 Medium-coloured clays, tempered fabrics; piecemeal manufacture:

Wares 13, (71)

B-2 Pale-firing clays, tempered fabrics; piecemeal manufacture:

Wares 26, 27, 29, (Sample 126).

C Unpainted: Cuzco Inca Plain

Dark-firing clay, untempered fabric; piecemeal manufacture

Ware 4.

D Unpainted: 'cooking pots':

D-1 Dark-firing clays, tempered fabrics:

Wares 8, 23.

D-2 Dark-firing clays, untempered fabrics:

Wares 1, 12.

E Simple painted or unpainted wares: copies of Cuzco Inca prototypes

Medium/pale-firing clays, untempered fabrics.

Wares 11, 40.

F Simple painted or unpainted wares: Cuzco Inca Polychrome shapes

Dark-firing clays, untempered fabrics; piecemeal manufacture.

Wares 9, 21.

G Unpainted: storage jars

Tempered fabrics.

Wares (39), 73.

Grouping of wares by stylistic affiliation and general fabric type

**MAJOR NON-PLASTIC INCLUSIONS**

|          |                |                          |
|----------|----------------|--------------------------|
| andesite | trachy-syenite | other                    |
| →        |                | dark clays → light clays |

SHAPE/DECORATION  
AFFILIATIONS

non-Inca, plain

S. 24  
W. 55, 58

non-Inca, painted      W.15

|              |      |
|--------------|------|
| V.24, 54, 57 | V.50 |
| (?S.155)     | V.69 |
| (S.400)      |      |

Cuzco-Killke,  
painted

V. 28                      \*W. 45  
   \*W. 66

V. 31

Cuzco-Inca  
painted

W. 13  
W. 26  
W. 27

\* (W. 71)                      \* (S. 126)

V.29

Cuzco-Inca  
(shape only)

\*W.4,9,21      W.6  
                    W.11, 40

utilitarian,  
so-called  
'Inca' shapes

W. 1, 8, 12      W. 23  
#W39, 73

— = tempered fabric  
\* = tempering practice uncertain



## Appendix 1-3. Illustrations

### Introduction

Cross-sections of body-sherds are drawn with the outside surface on the right-hand side.

Segmental construction is shown by breaks in the cross-sections.

Key to conventions used for pigments:

black to grey



(brown) red to purple



white



### Descriptions

Figure or plate number is followed by the Ware number, the Form code; the decoration code outside, inside; scale. Notes.

Figure 1a Ware 1, Form A; B22 (1); 1:2.

1b Ware 1, Form C; 1:2.

2 Ware 4, Form E; B22 (1); 2:3.

This drawing shows only one possible version of base construction, with a solid plug of clay forming the stem of the pedestal; the pot, the stem, and the pedestal base are welded together with a thick sheath of clay. As often, the 'plug' and the 'sheath' are replaced by a

vertical roll of clay, splayed at either end, and smeared onto the base and the pot.

3a Ware 13, Form H; 1:2.

While the relative proportions appear to be consistent, actual sizes vary. The great majority are twice the size of the drawing; a small number have larger rim radii. No decoration is shown, as decorated examples are illustrated frequently in the literature: see references in Appendix 1:1, Ware 13.

3b Ware 13, Forms K and three types of handle; B5B (handle), B 23 (+), B4A (1); 3:4 (some examples are smaller).

3c Ware 13, Form J with double lug; B22 (+), B20 (1); 3:4 (some examples are smaller).

4 Ware 15, body sherd; B3C; 1:1

5 Ware 21, Form K; B22, 23 (+), B9B, 23 (1); 1:1.

6a Ware 23, Form A; 1:2

6b Ware 23, Form A rims; 1:1

7a Ware 24, Form M; B3A (+), B1B (1); 3:4

7b Ware 24, Form M; (B23 (+)), B3A (1); 3:4

8 Ware 27, Form L; B22, 23, 20 (+), 22 and 23 (1); 1:1.

See Figure 3a notes: proportions are constant, but actual sizes vary: a minority are smaller.

9 Ware 28, body sherd; B4C; 1:1

10 Ware 31, body sherd; B3/4A; 1:1

11 Ware 39, rim profiles; 1:1

12a Ware 45, Form N rim profiles; 1:1

12b Ware 45, body sherd; B4A; 1:1

- 12c Ware 45, body sherd; B4D, 'llamitos', 1:1
- 12d Ware 45, body sherd; B4D, 'llamititos'; 1:1
- 12e Ware 45, body sherd with indented knob; B4D, 'llamas';  
1:1
- 12f Ware 45, Form G; 1:1
- 13a Ware 50, body sherd; B2B; 1:1
- 13b Ware 50, body sherd and handle; B2B; 1:1
- 14a Ware 54, Form M; B1B; 3:4
- 14b Ware 54, Form M; B3A (1); 1:1
- 15 Ware 55, Form K; 1:1
- 16 Ware 58, Form B/M; 1:1
- 17 Ware 66, body sherd; B4A; 1:1
- 18a Ware 69, body sherd; B1B/2B; 1:1
- 18b Ware 69, Form M; B4D (1); 1:1
- 19 Ware 71, Form K; B23 and 11 (1), 'llamititos'; 1:1
- 20 Ware 73, Form B rim profiles; B22 (1); 1:1
- 21a Sample 400, neck-body sherd; C7; 1:1
- 21b Sample 400, body sherd; C7; 1:1

Plate 1a Ware 1, Form A; B22. Scale in cms.

(Unusually unsmudged example)

1b Ware 1, Form A. Scale in cms.

Inside view, showing rim/shoulder junction, thin wall,  
and more usual smudged appearance.

2a Ware 4, Form A: rim. 3:1

Hand specimen, vertical cross-section. Note large  
granite clast.

2b Ware 4, Form E. c.1:3

Reconstructed pot, lacking its base. Note segmental join above carination, and polishing facets.

2c Ware 4, Form E.

The same. Note butt-welded handle.

2d Ware 4, lid with animal-head handle. Scale in cms

The black area is an ash-glaze (?accidental).

3 Ware 8 and Sample 176

Mass-production in a potter's yard at Raqchi. Sample 176 was used to make the stacked pots: note coil construction and finishing marks. Ware 8 is the small, fat black pot in the centre.

4 Ware 9, Form J rim. 2:1

Hand-specimen, vertical cross-section. Note smooth surfaces.

5a Ware 11, body-sherd. 1:1

Inside view, showing coil in the midst of abraded surfaces.

5b Ware 11, neck-shoulder sherd. 1:1

Inside view. Note junction, and condition of slip

6a Ware 13, Form H body sherd. 2:1

Hand-specimen, vertical cross-section. Note smooth finish on upper, outside surface, and coil undulations on lower.

6b Ware 13, Form H. 1:4

Reconstructed pot, lacking neck, rim and handles. Note thin walls, diagonal polishing facets, and smooth glossy

surface. The firing clouds and lack of any paint are unique in Cusichaca.

7 Ware 29, Form J rim. 3:2.

Hand-specimen, vertical cross-section. The upper surface is the inside: note the outward flare in the profile, and the smooth surfaces. Red inclusions are clay pellets.

8a Ware 45, body sherd. 3:2

Hand-specimen, vertical cross-section. Visible inclusions are all trachy-syenites, with weathered and fresh surfaces.

8b Ware 45, Form M; B4A. Scale in cms.

Reconstructed pot, showing typical tonal contrasts of paint/body, carved appearance of rim, and drooping butt-welded handles.

8c Ware 45, (?Form M) body; B4C. Scale in cms

Reconstructed body, showing pale (unslipped) surface, streaky pigment, and variable pigment colours.

9 Ware 54, body sherds; B3A. 1:1

Note surface texture, pigment texture, scale of designs, and tonal contrasts.

10 Ware 66, base sherd. 3:2

Hand-specimen, latitudinal cross-section. Note horizontal lacunae, and red clay pellets.

11a Ware 69, body sherd. 2:1.

Hand-specimen, vertical cross-section. Coils are visible in profile on the upper (inner) surface.

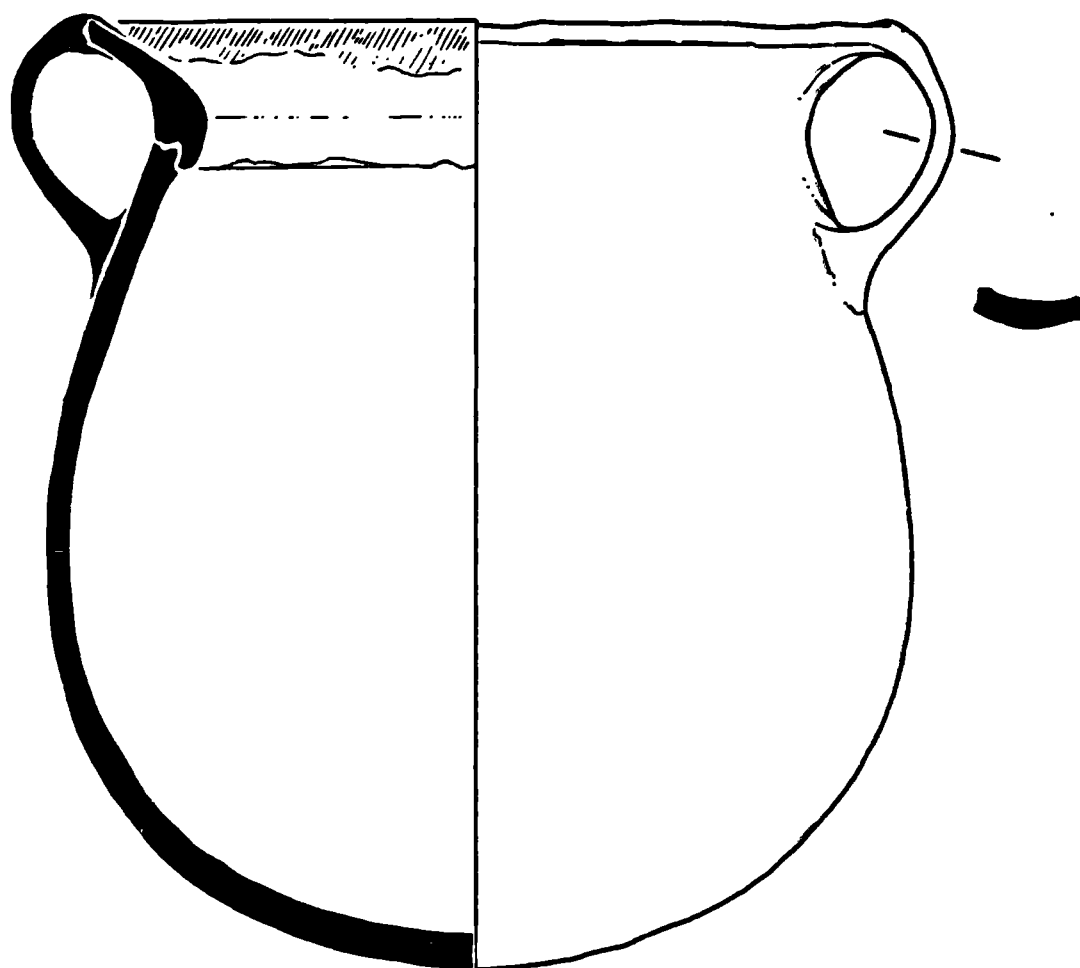
11b Ware 69, Form N; B4C. Scale in cms

Note the way the pigment has sunk right into the surface, and fuzzed at the edges.

12 Sample 400, ?Form N rim. 2:1

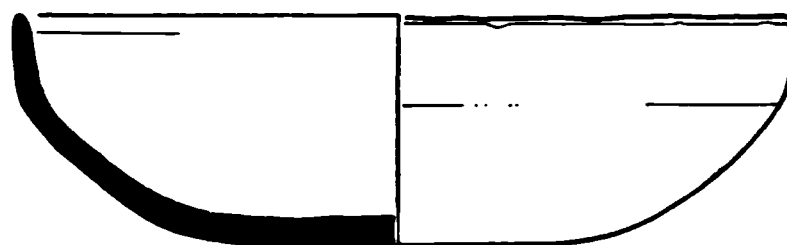
Hand-specimen, vertical cross-section.

(I am grateful to the following Cusichaca Project photographers: Matthew Beald-Collins for plates 1a, 8b, 8c; Eva Binnemans for plate 13; Carolyn Kerson for plates 1b, 2a, 2d, 3, 4, 6a, 6b, 7, 8a, 10, 11a, 11b, 12; Ross Owen for plate 5b; and Bruce Samson for plates 2b, 2c and 5a).



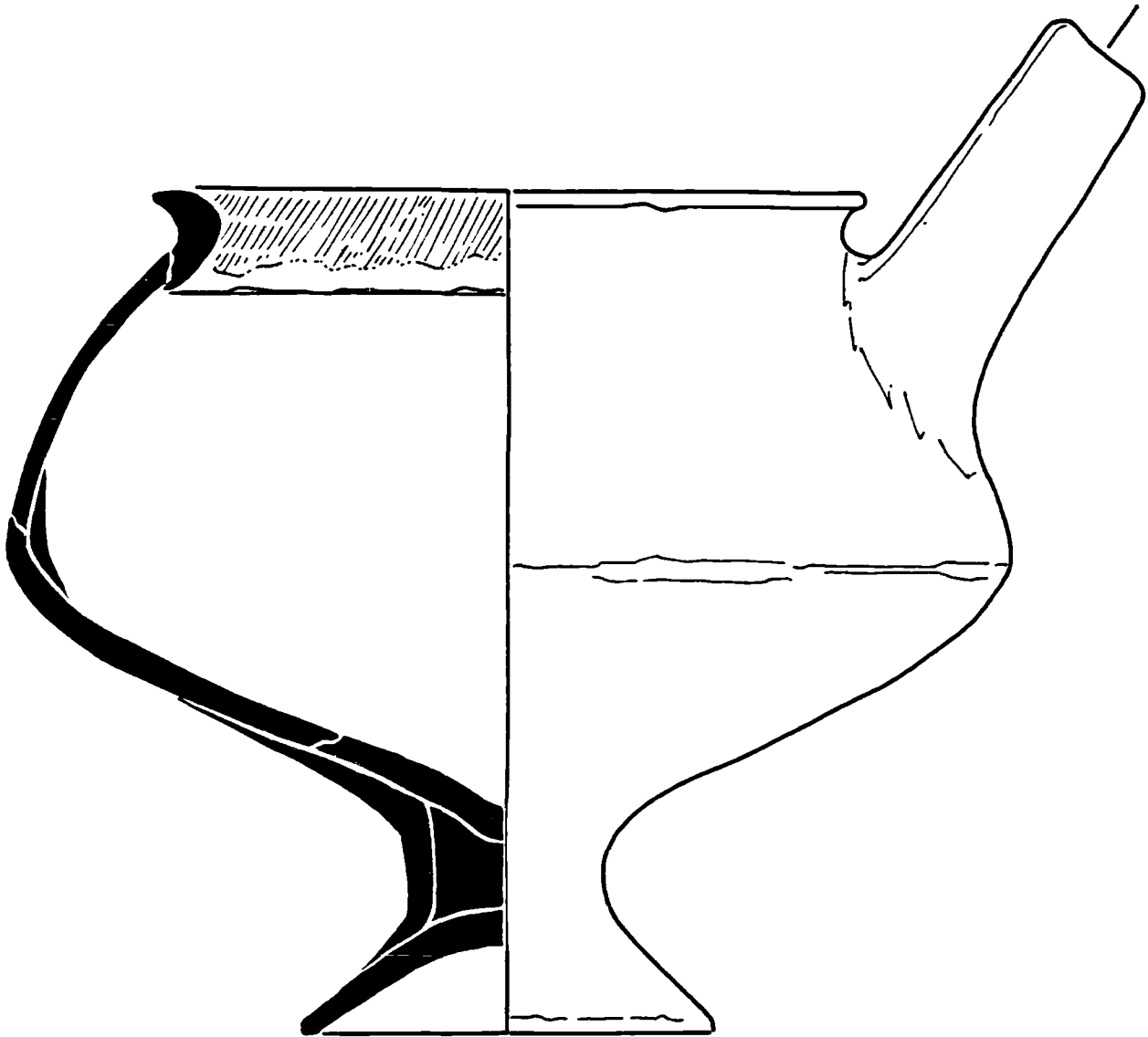
1a

Vare 1, Form A; B22 (1); 1:2.



1b

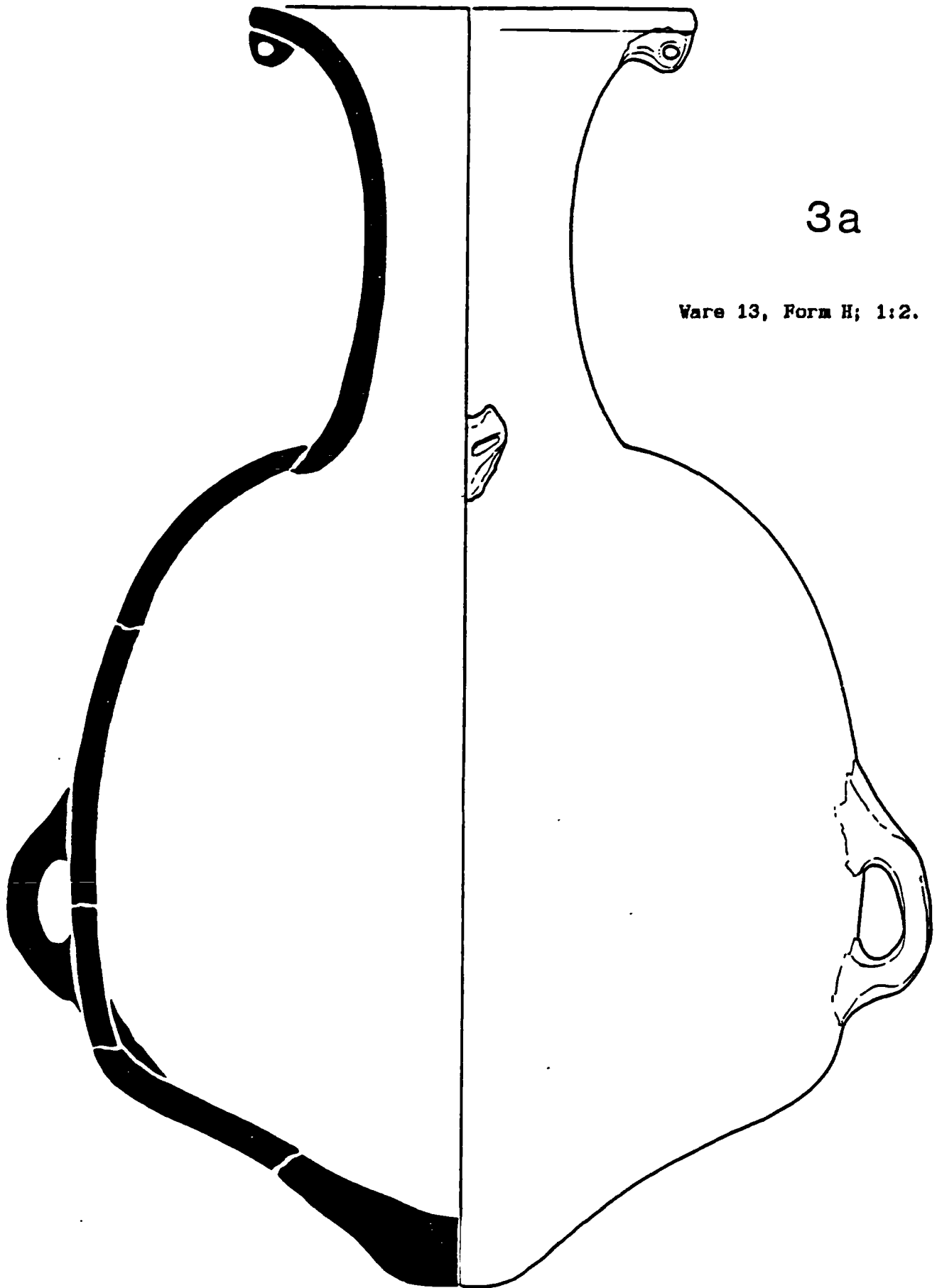
Vare 1, Form C; 1:2.



2

Vare 4, Form B; B22 (1); 2:3.

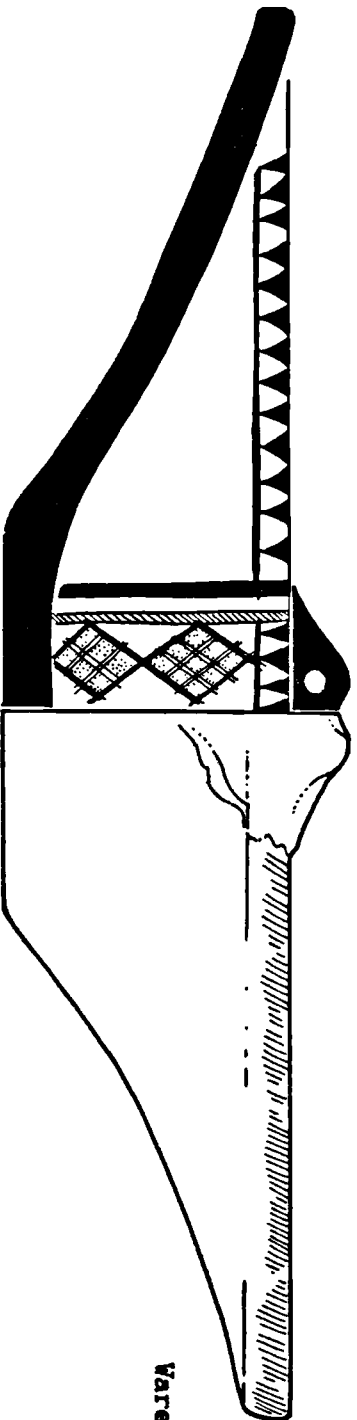
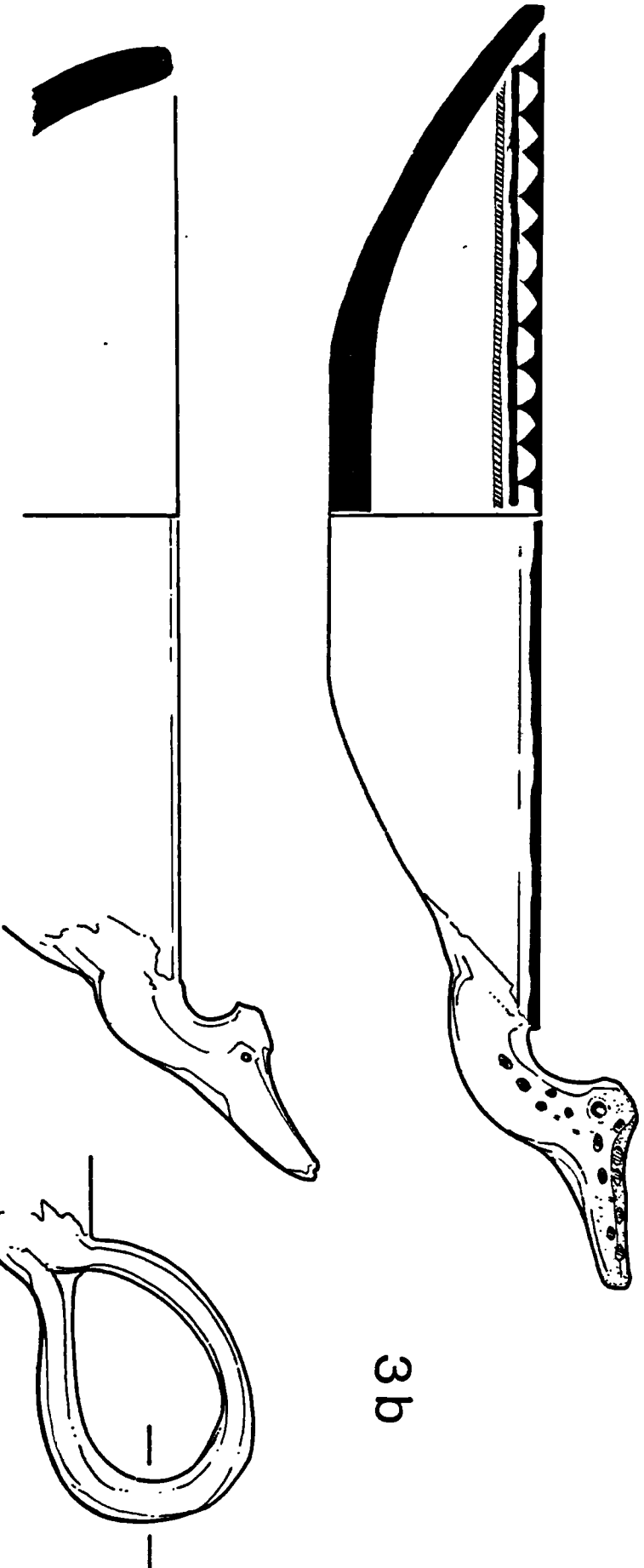




3a

Ware 13, Form H; 1:2.

Vare 13, Forms K and three types of handle; B5B (handle),  
B 23 (+), B4A (1); 3:4



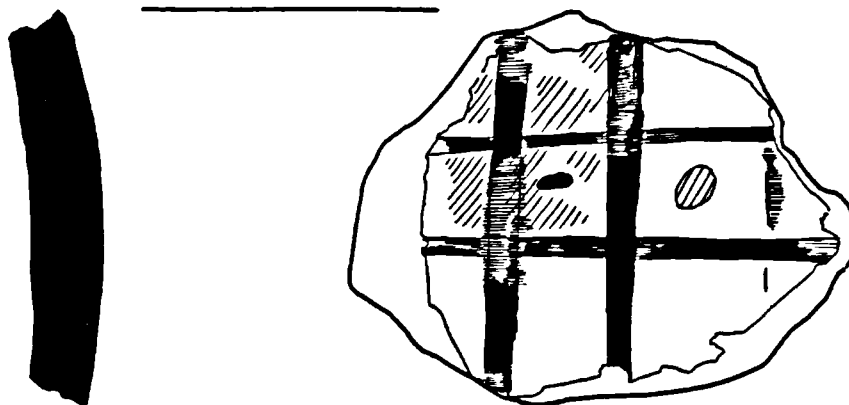
Vare 13, Form J with double lug;

B22 (+), B20 (1); 3:4

3c

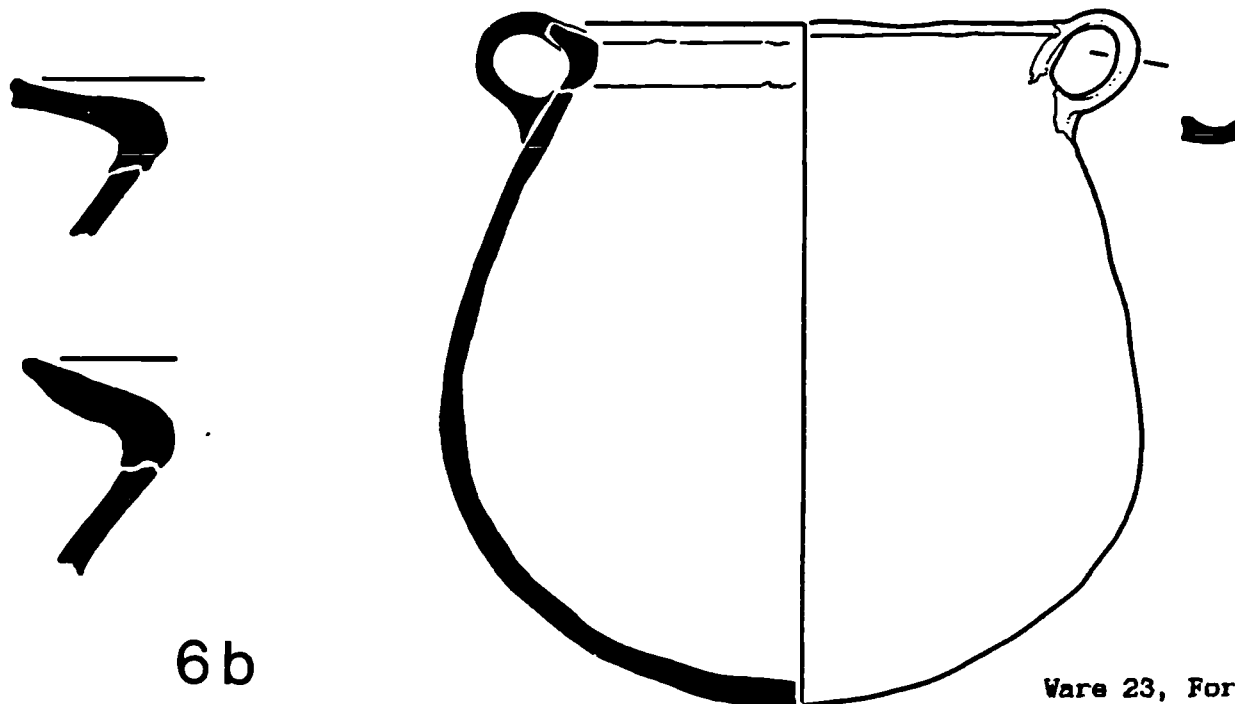
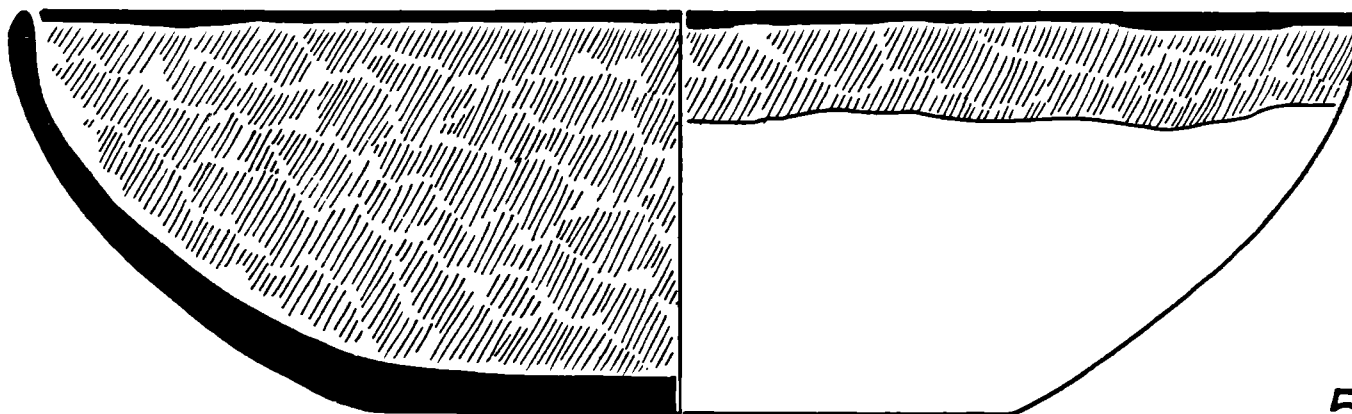
Ware 15, body sherd; B3C; 1:1

4

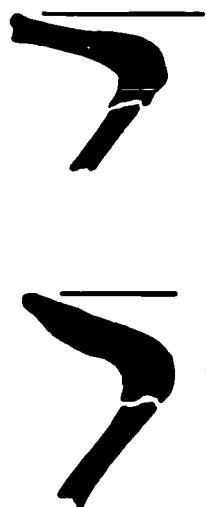


Ware 21, Form K; B22, 23 (+), B9B, 23 (1); 1:1.

5



6b



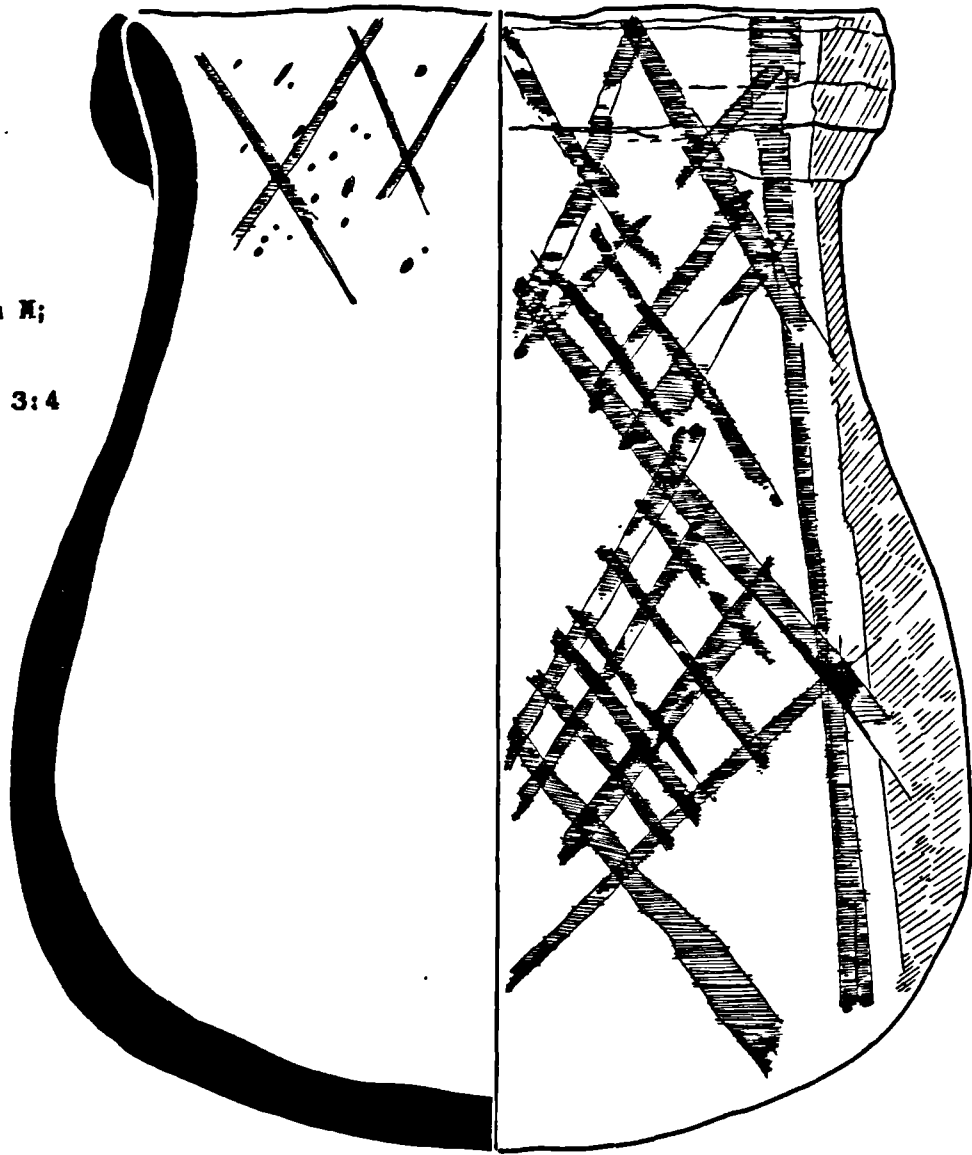
Ware 23, Form A; 1:2

Ware 23, Form A rims; 1:1

7a

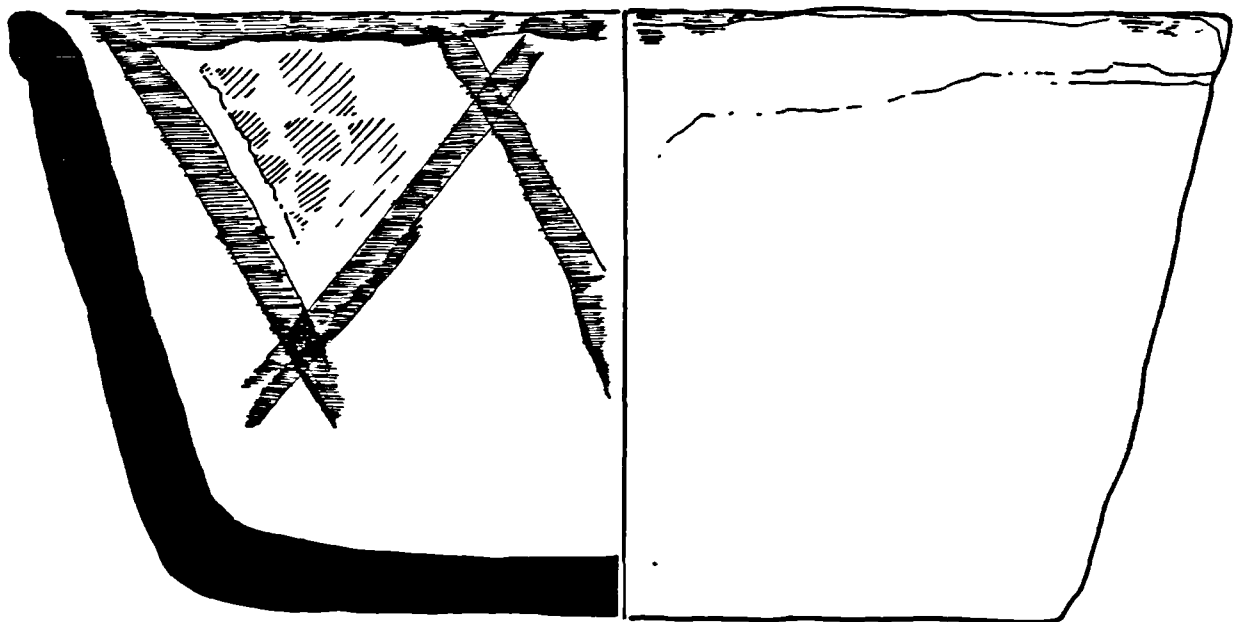
Vare 24, Form N;

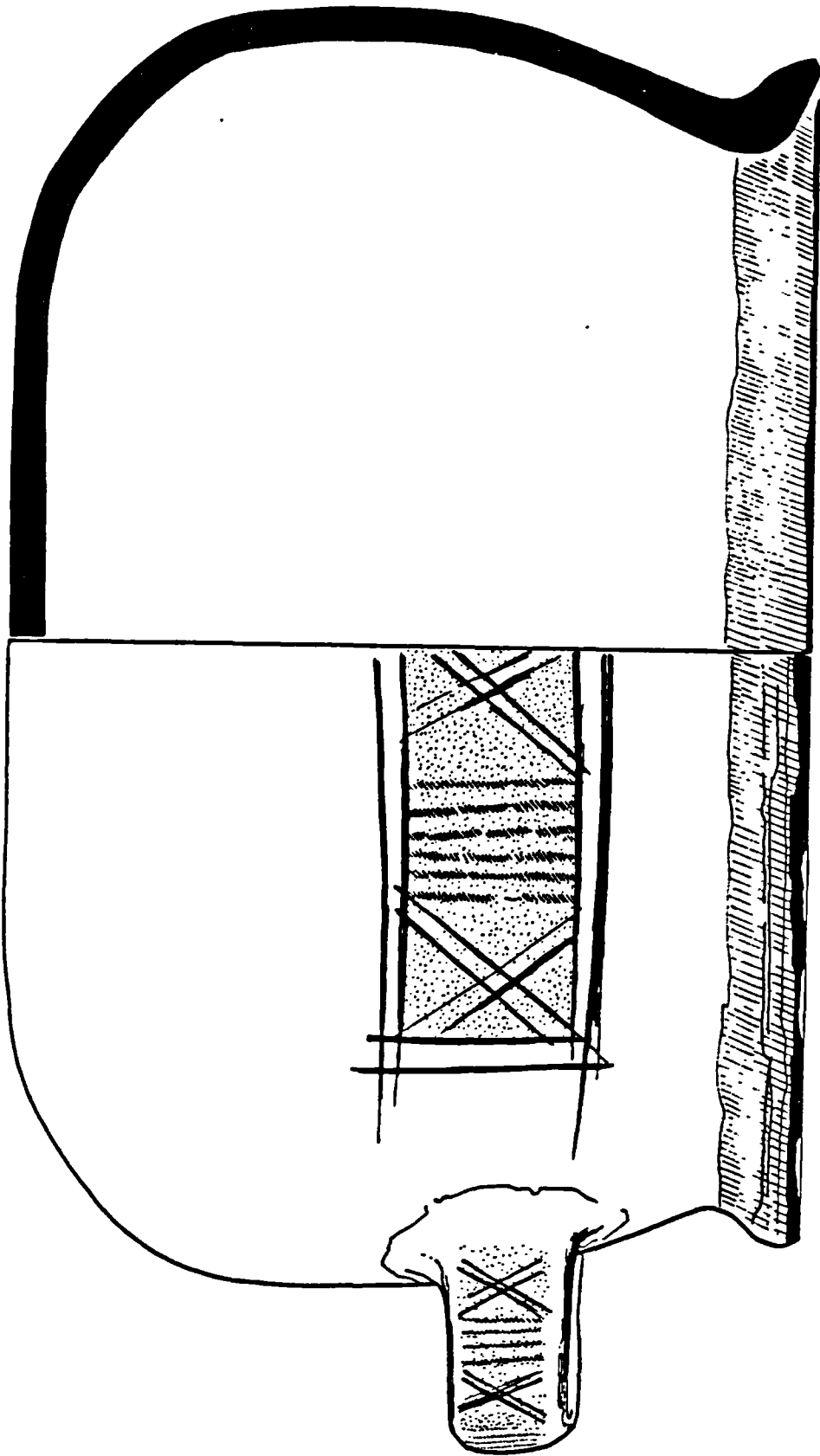
B3A (+), B1B (1); 3:4



7b

Vare 24, Form N; (B23 (+)), B3A (1); 3:4



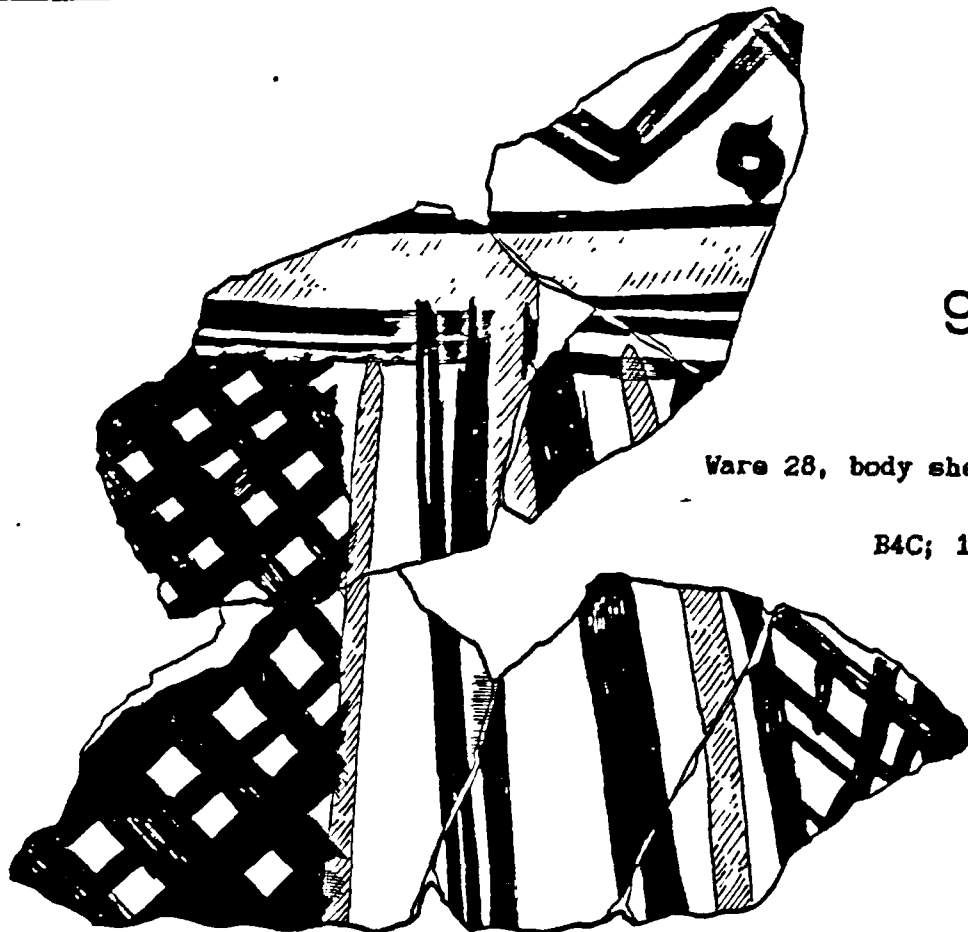


Ware 27, Form L; B22, 23, 20 (+), 22 and 23 (1); 1:1.

9

Ware 28, body sherd;

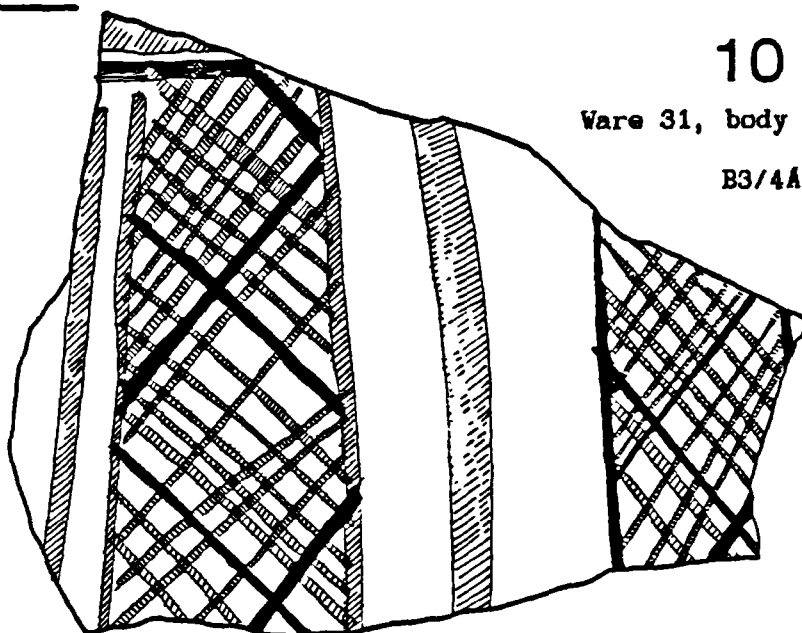
B4C; 1:1



10

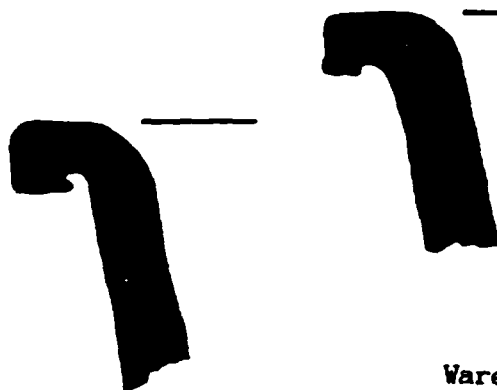
Ware 31, body sherd;

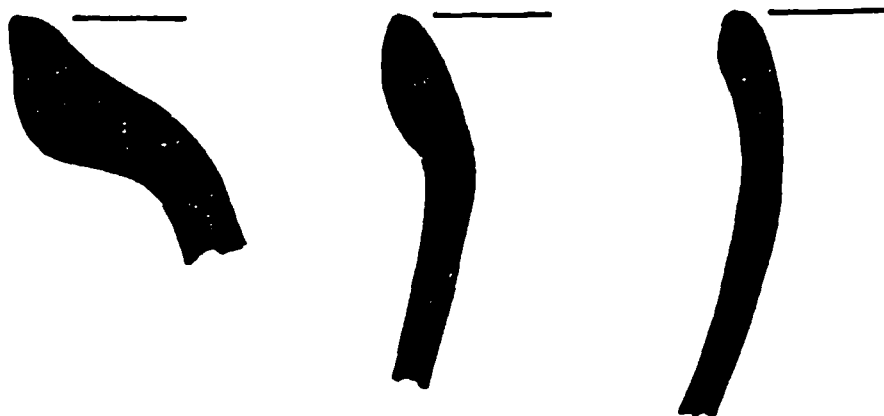
B3/4A; 1:1



11

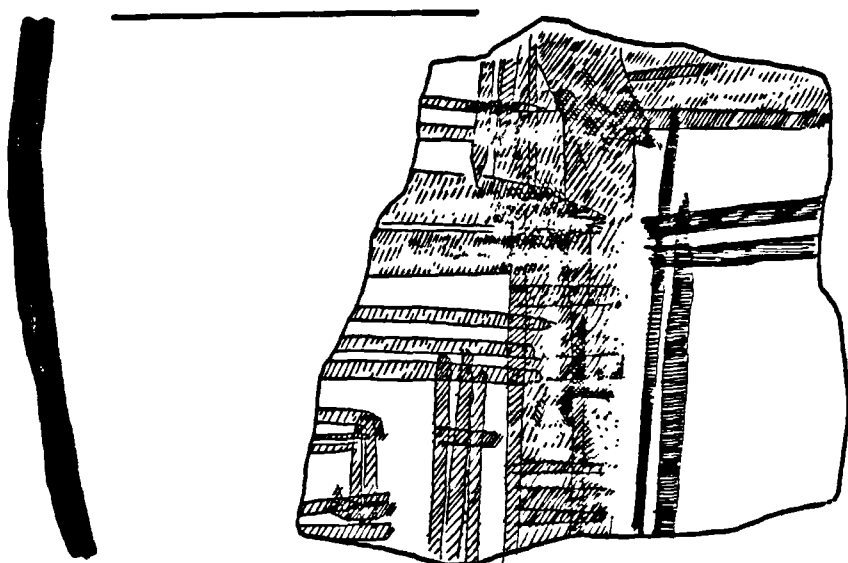
Ware 39, rim profiles; 1:1





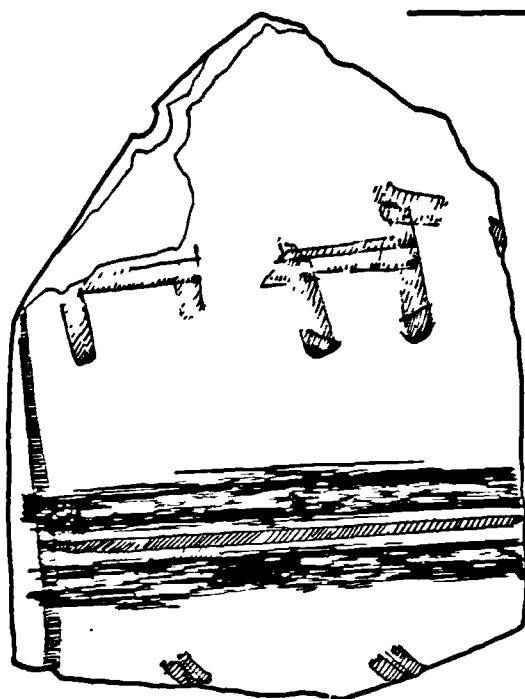
12a

Ware 45, Form M rim profiles; 1:1



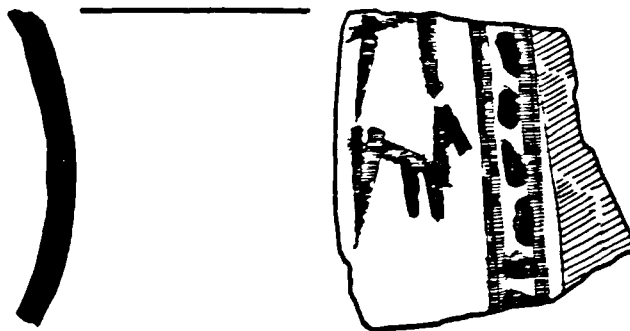
12b

Ware 45, body sherd; B4A; 1:1



12c

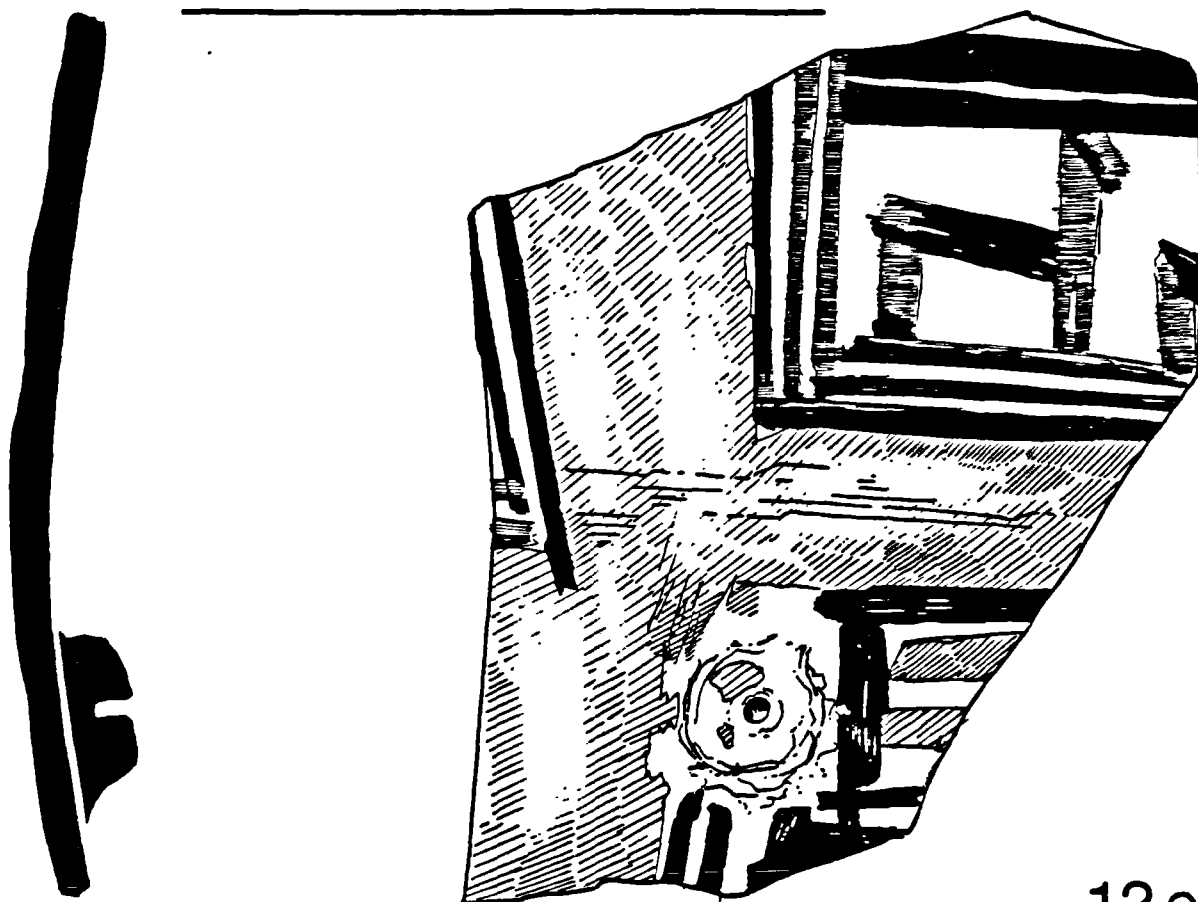
Ware 45, body sherd; B4D, 'llamitos', 1:1



12d

Ware 45, body sherd;

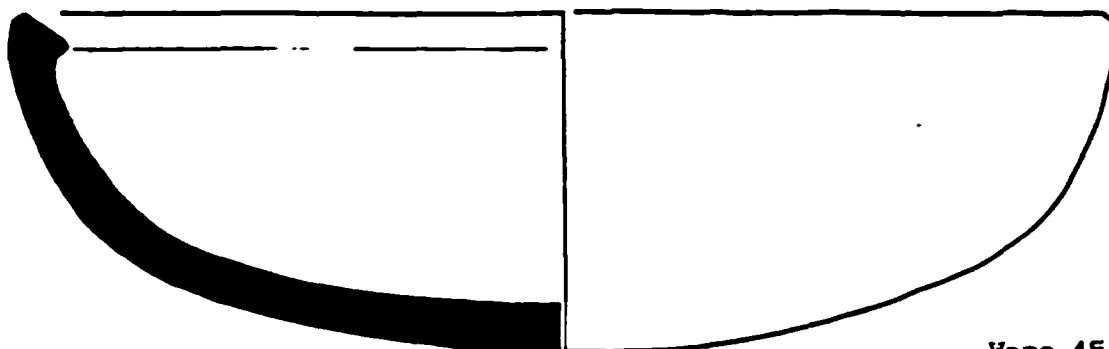
B4D, 'llamititos'; 1:1



12e

Ware 45, body sherd with indented knob; B4D, 'llamas';

1:1



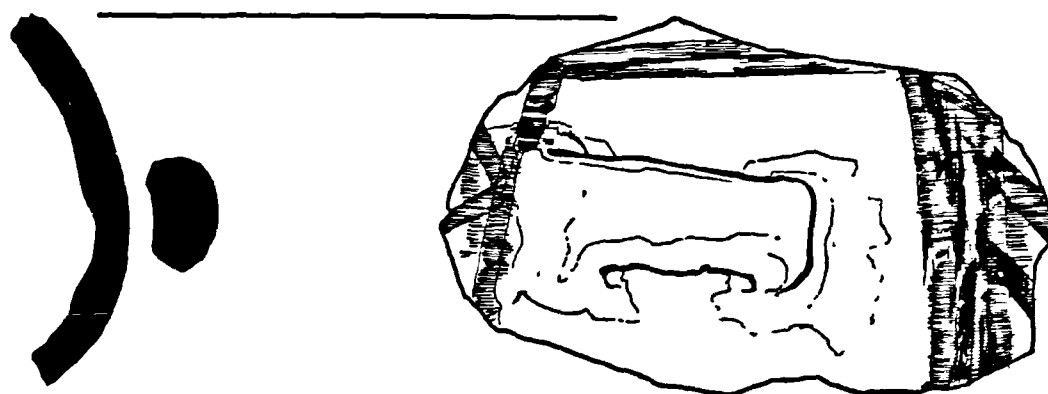
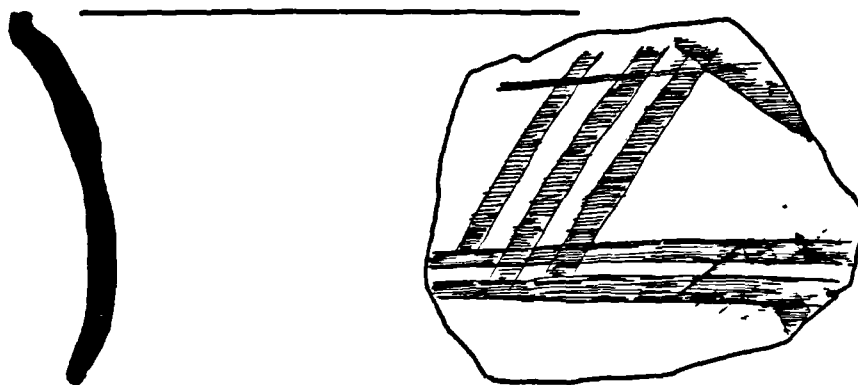
12f

Ware 45, Form G; 1:1



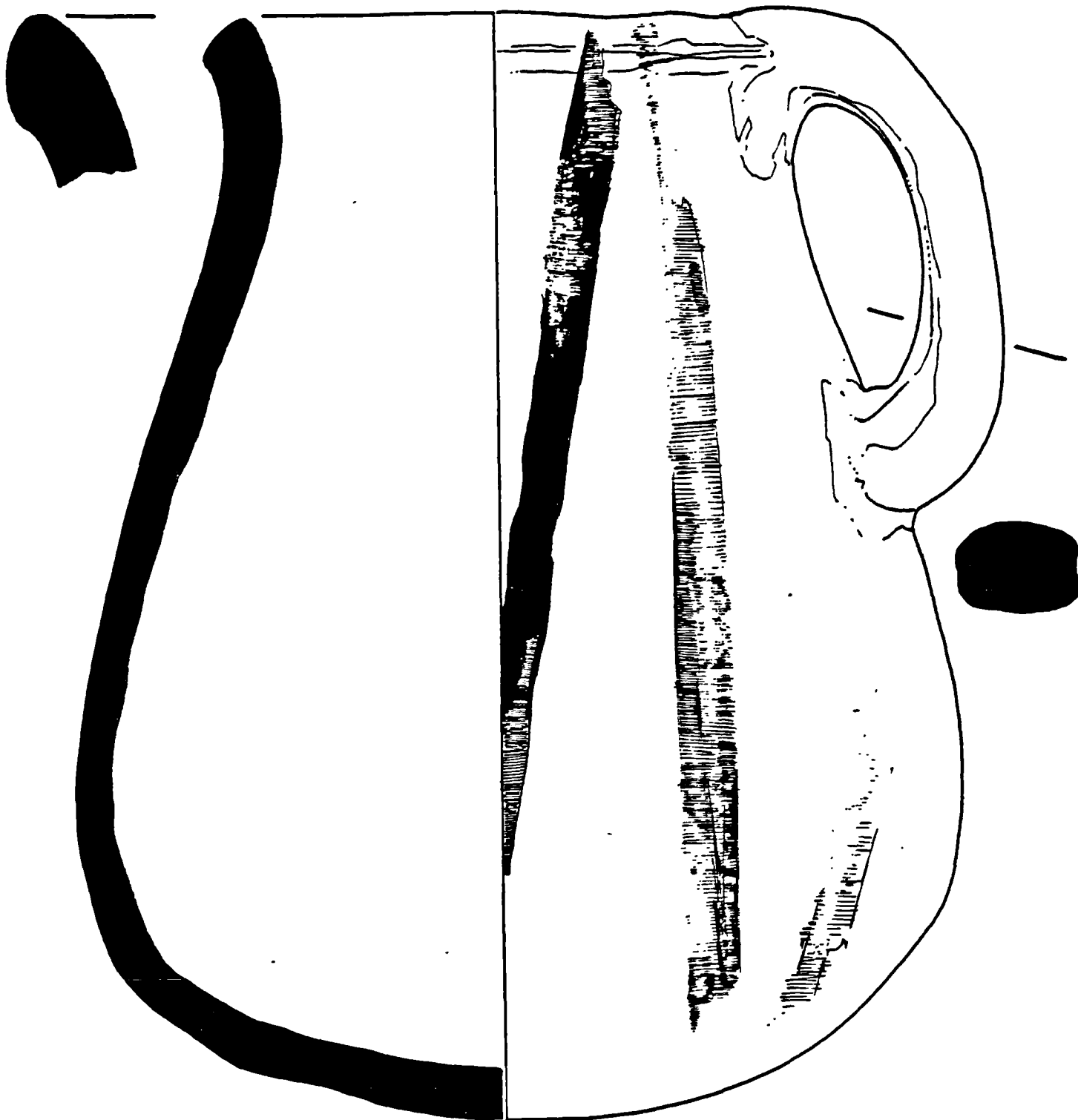
13a

Ware 50, body sherd; B2B; 1:1



13b

Ware 50, body sherd and handle; B2B; 1:1

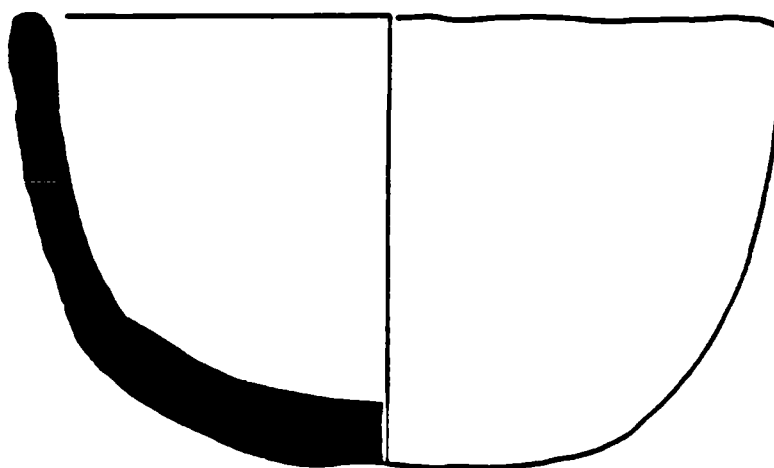
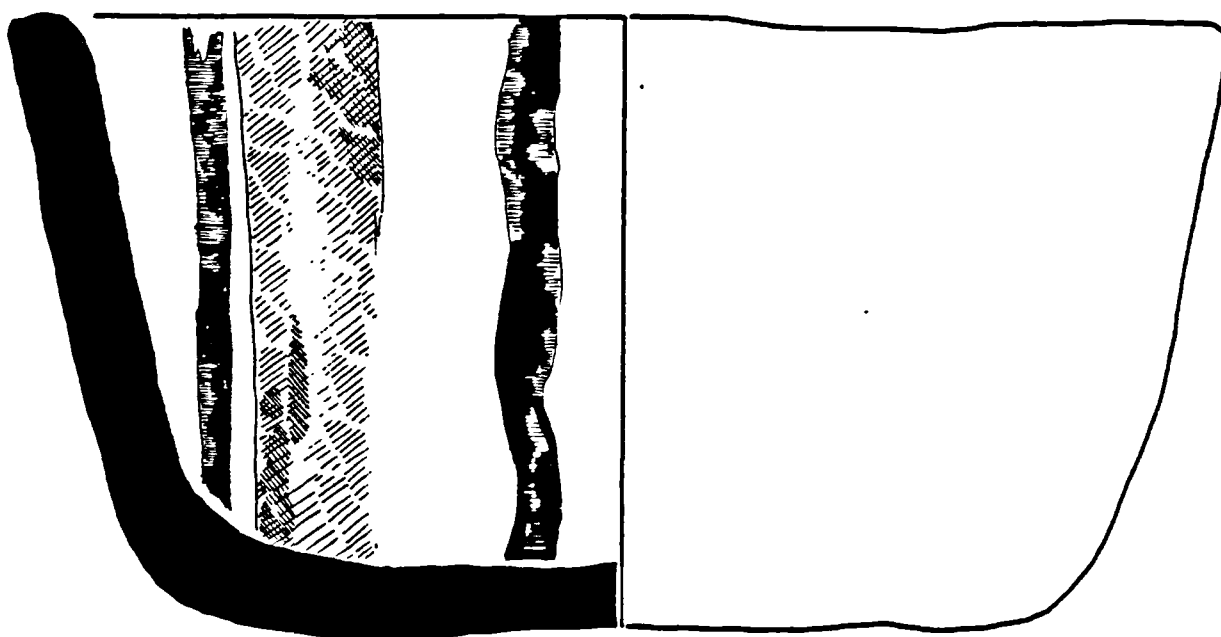


14a

Ware 54, Form M; B1B; 3:4

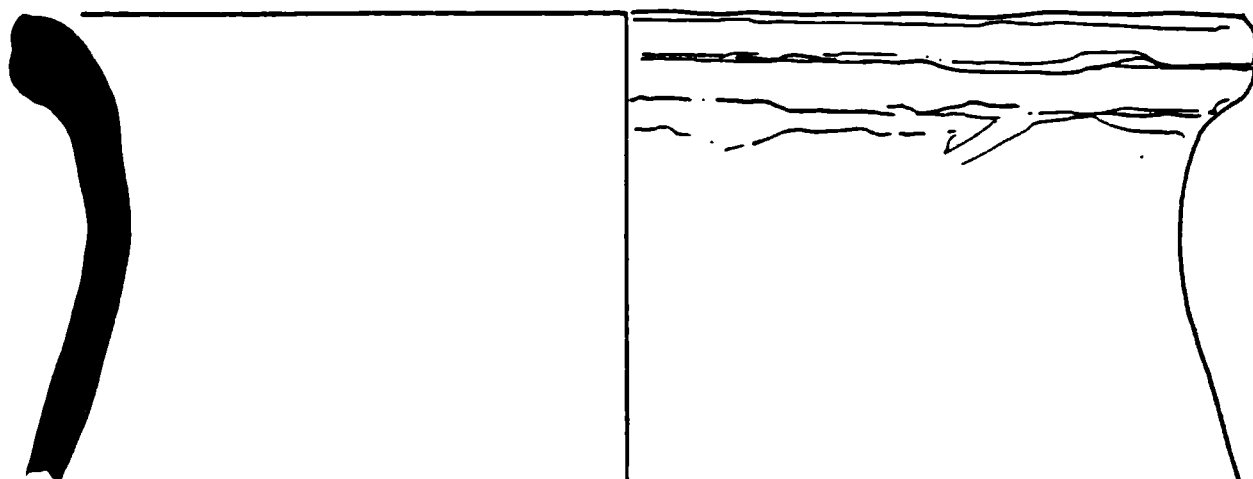
14b

Ware 54, Form N; B3A (1); 1:1



15

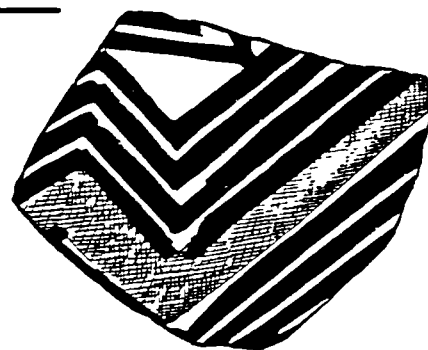
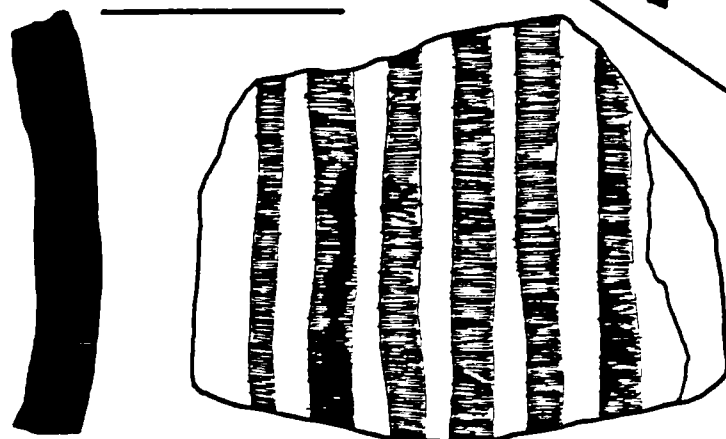
Ware 55, Form K; 1:1



Ware 58, Form B/M; 1:1 16

18a

Ware 69, body sherd; B1B/2B; 1:1

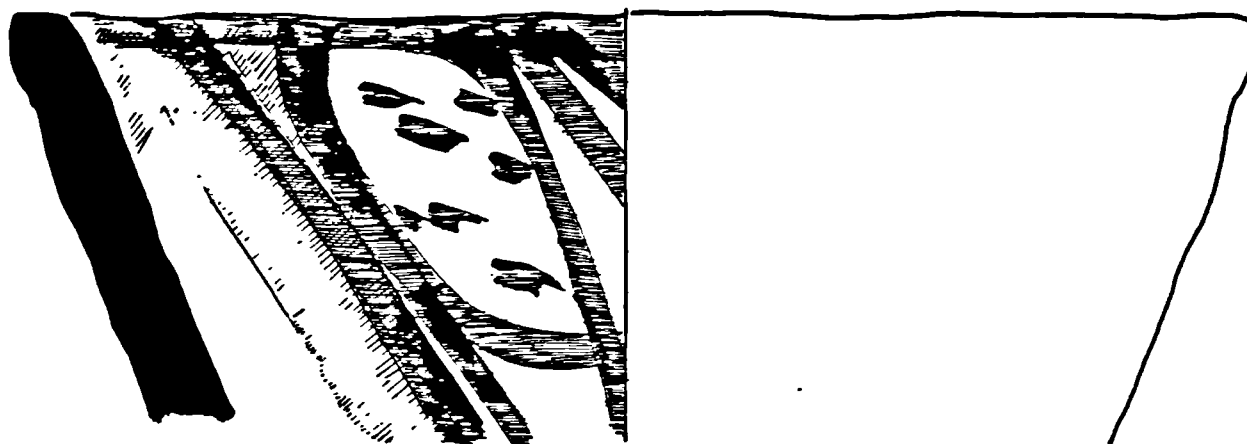


17

Ware 66, body sherd; B4A; 1:1

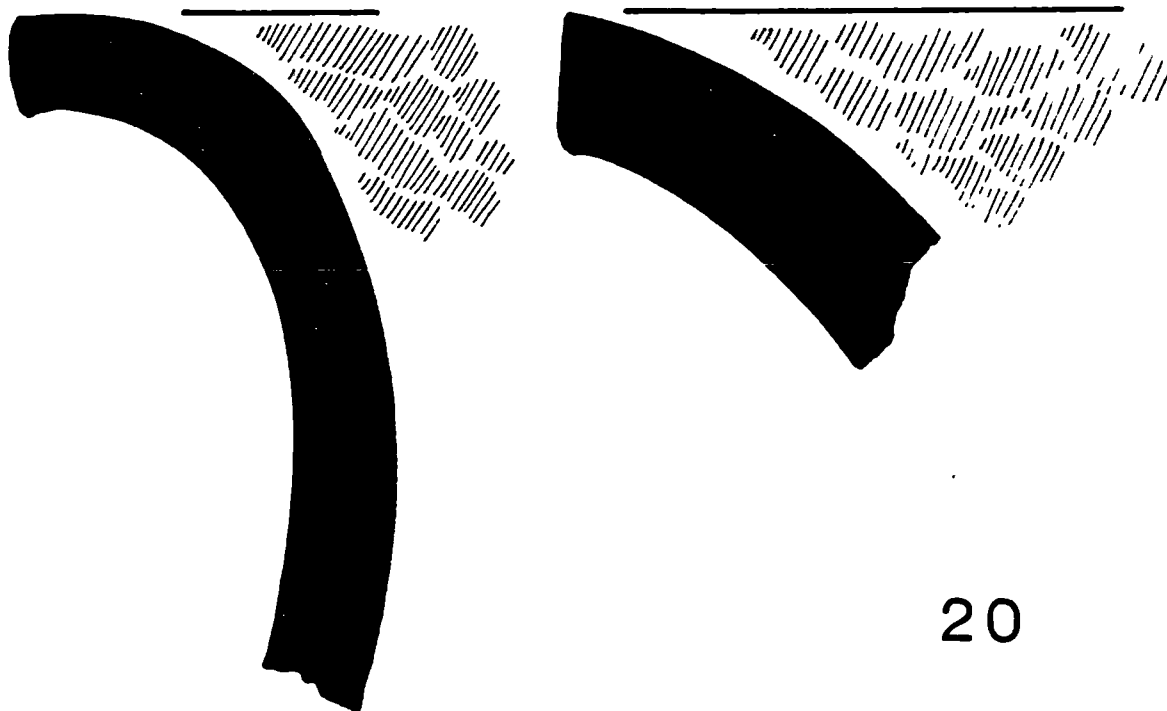
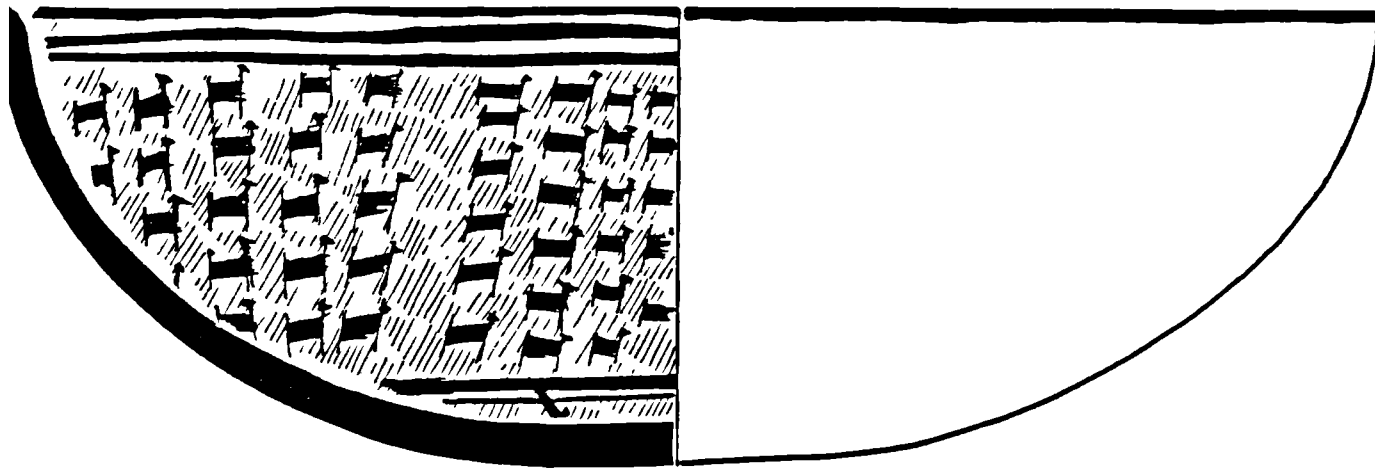
18b

Ware 69, Form N; B4D (1); 1:1



19

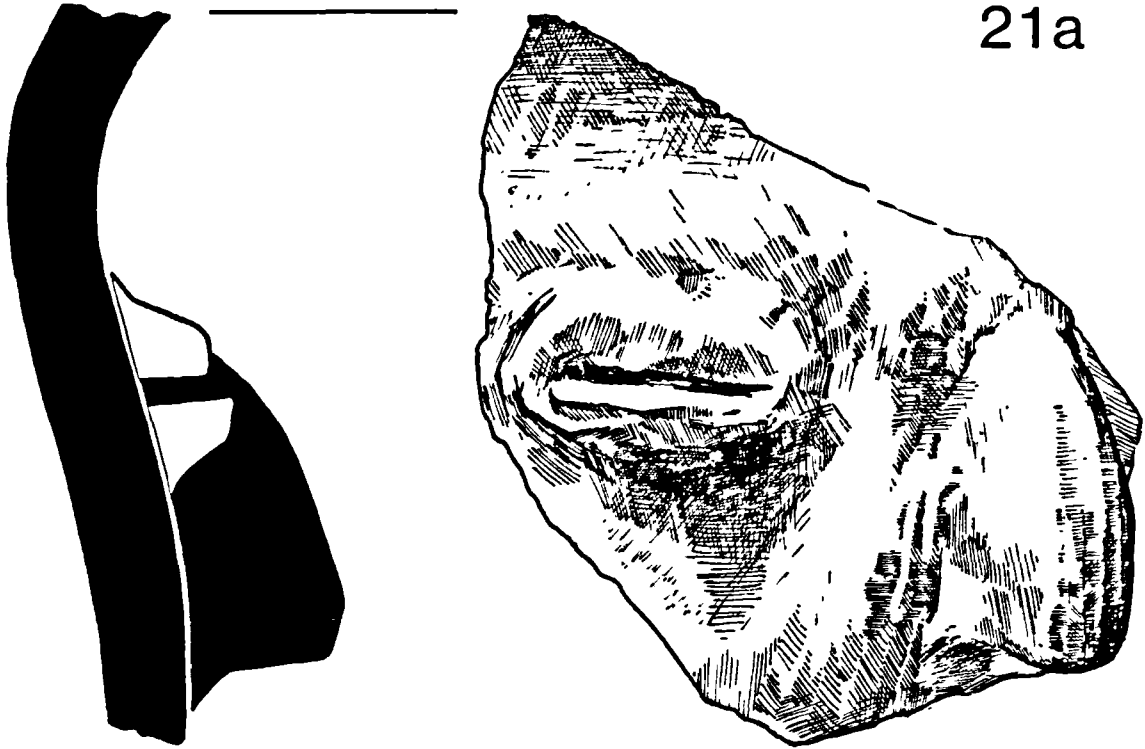
Ware 71, Form K; B23 and 11 {1}, 'llamititos'; 1:1



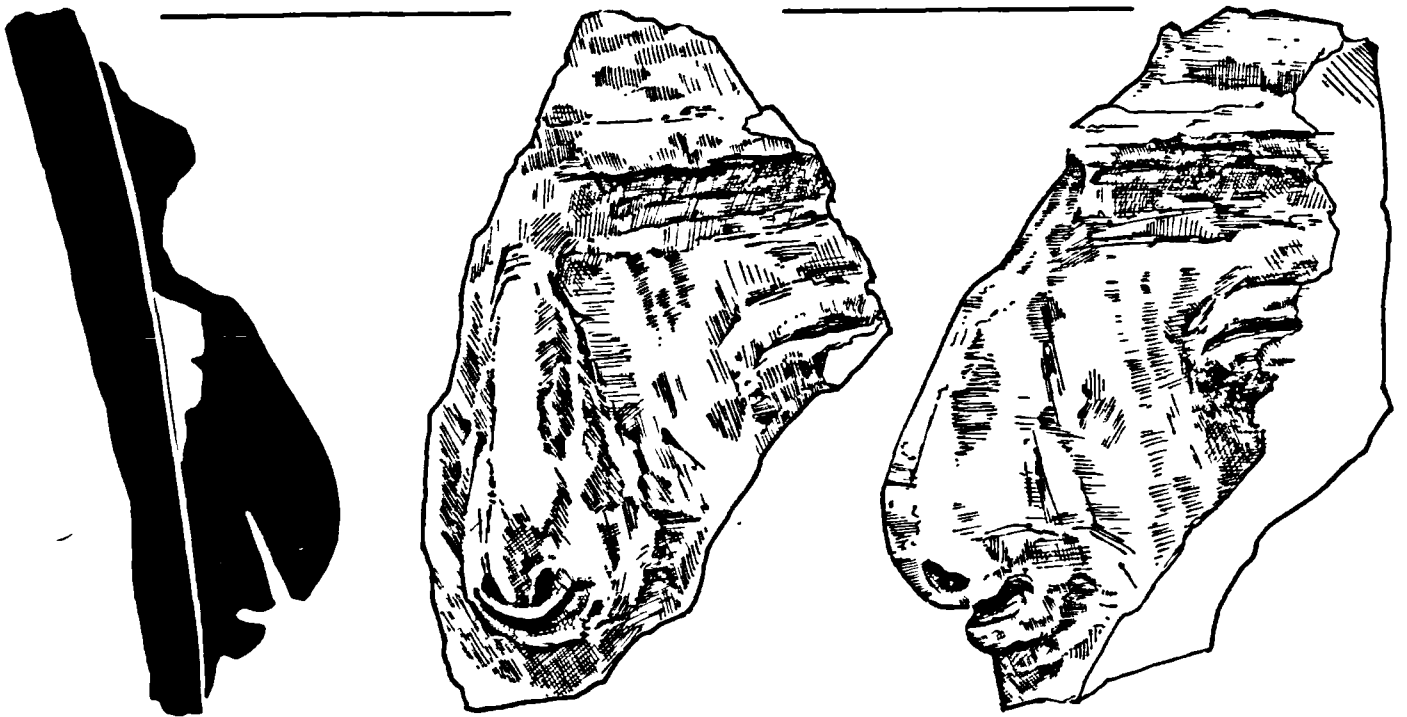
20

Ware 73, Form B rim profiles; B22 {1}; 1:1

21a

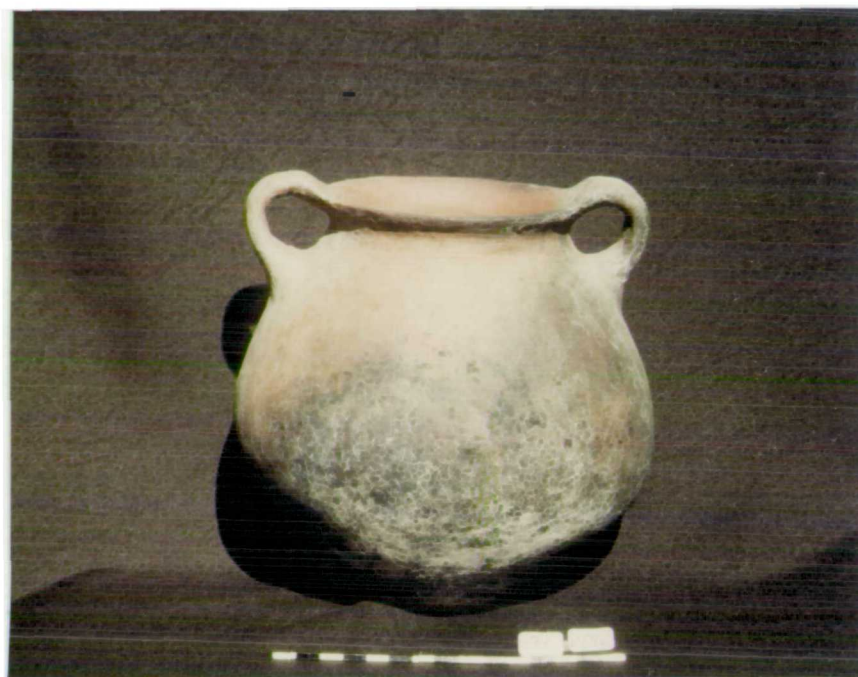


Sample 400, neck-body sherd; C7; 1:1



21b

Sample 400, body sherd; C7; 1:1



1a

Ware 1, Form A; B22. Scale in cms.



1b

Ware 1, Form A. Scale in cms.



2a

Ware 4, Form A: rim. 3:1





Ware 4, Form E.  
c.1:3

2b



Ware 4, Form E.

2c



Ware 4, lid with animal-head handle. Scale in cms

2d





Ware 8 and Sample 176

3



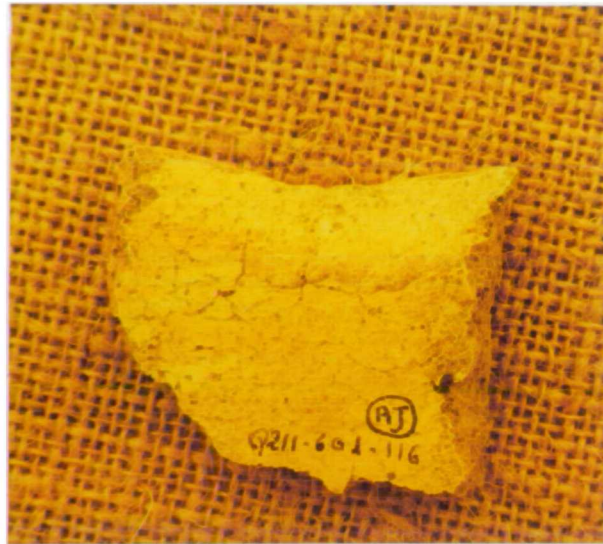
Ware 9, Form J rim. 2:1

4



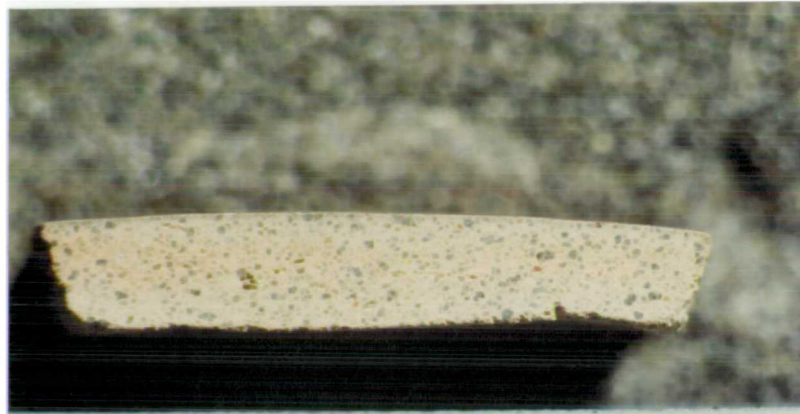
Ware 11, body-sherd. 1:1

5a



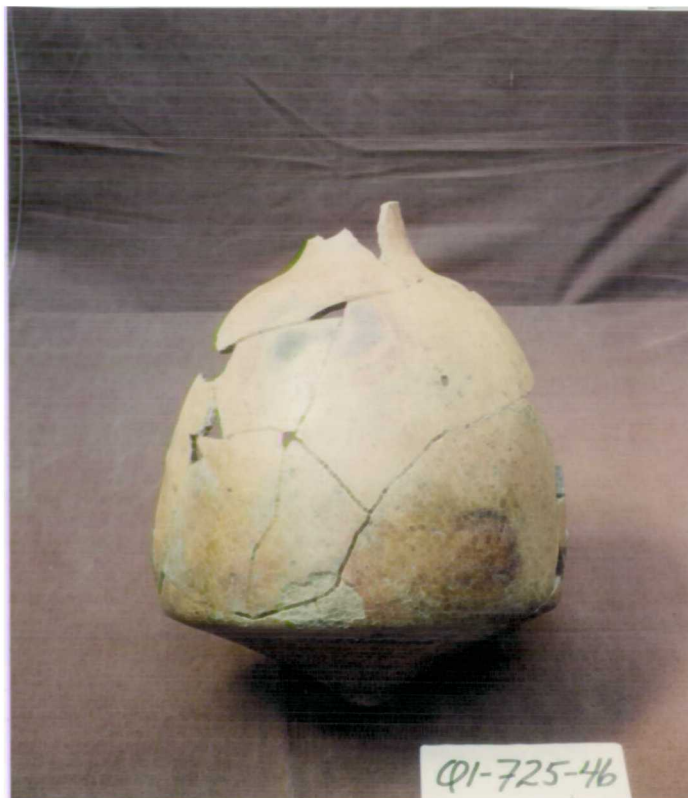
5b

Ware 11, neck-shoulder sherd. 1:1



6a

Ware 13, Form H body sherd. 2:1



6b

Ware 13, Form H. 1:4





7

Ware 29, Form J rim. 3:2.



8a

Ware 45, body sherd. 3:2



8b

Ware 45, Form M; B4A. Scale in cms.



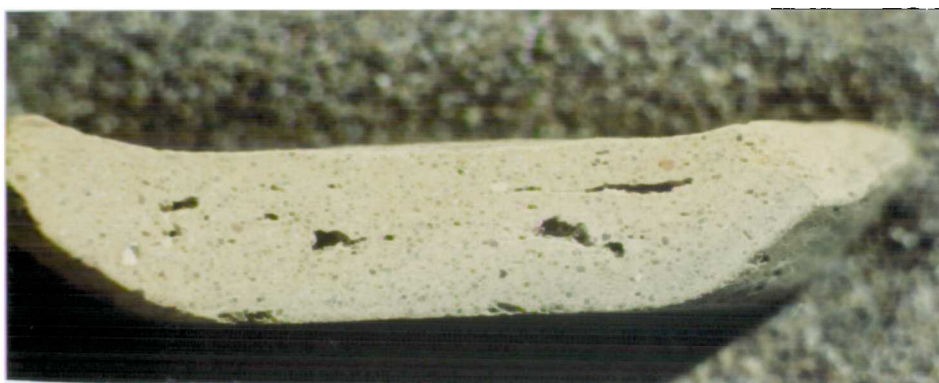
8c

Ware 45, (?Form N) body; B4C. Scale in cms



9

Ware 54, body sherds; B3A. 1:1



10

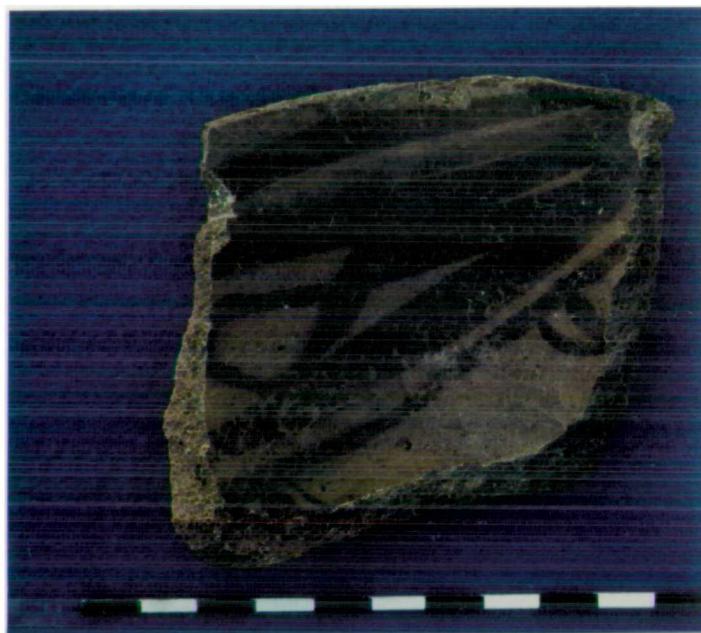
Ware 66, base sherd. 3:2





11a

Ware 69, body sherd. 2:1.



11b

Ware 69, Form M; B4C. Scale in cms



12

Sample 400, ?Form M rim. 2:1

## APPENDIX 2. Raw materials and analyses

1. Clays (see also Appendices 3, 6).
2. Fabrics and temper (Appendices 1, 3).
3. Pigments (Appendix 5).
4. Firing temperatures (Appendix 3).

There were three aims in the analyses:

- a) to characterise the archaeological ceramic materials (2 and 3), so that, on the one hand, certain effects could be understood and, on the other, comparison with geological specimens could be made;
- b) to characterise relevant geological samples (1 and 2) with a view to identifying source areas for the archaeological materials;
- c) to understand some of the technological processes.

In the event, many of the analyses are incomplete, or highly unsatisfactory, because time ran out or because the samples were small. But the preliminary results are suggestive, and will form the basis of further work. For reasons of space, the details of the sampling, analytical procedures, and tables of results, are not presented here. They are held in archive, and some will be published in due course (e.g. Ixer and Lunt forthcoming). For the reasons given below some analytical work was abandoned (e.g. that on clays). Other forms of analysis, such as chromatographic analysis of organic residues (Evans 1983/4; Hill 1983/4), and textural analysis (see

discussions in Freestone et al 1982: e.g. Darvill and Timby) have potential for these ceramics, and should be undertaken in due course.

# 1. Clays

There are a number of primary and secondary clays in the Cusichaca valley and in the adjacent areas. The primary clays have developed from shales and metamorphics upstream of Huayllabamba. The secondary clays are riverine or morainic. Soils in the lower Cusichaca are clay-rich, clay content increasing with depth (Jones 1977; Keeley 1984).

Only one primary clay was sampled, the remainder being too inaccessible. A number of other clays were sampled, from the following locations (see Appendix 7, maps 1 and 7):

primary clay: below ridge overlooking Urubamba, 250m north of 10 (map 1).

secondary clays:

- a) in the Cusichaca valley from 10 (map 7) to 14 (map 1), at approximately 2km intervals. A traverse was made across the floor of the valley, and up either side as far as possible, at each point: both clays and clayey soils were sampled;
- b) on the tableland between 5 and 6 (map 1);
- c) in the hinterland of 8 and 9 (map 1);
- d) in the tributary valley between 9 and 10 (map 1);
- e) in the Urubamba valley, both sides of the river, from below 22 (map 1) to 1 km east of 14 (map 1), at 50m intervals;

f) from random locations at Chincheros, Ollantaytambo, Pisaycucho, Raqchi and Chocamarca (map 7).

Samples of adobé from the Inca buildings on all of the Cusichaca sites, and from pre-Inca buildings on Q2-1, were included in the experimental work (see Appendix 3).

No systematic clay surveys have been made in the Cuzco region. Gregory (1916) refers to primary clay beds of Early Pleistocene age in the San Sebastian and Killke formations, exposed sporadically in Cuzco itself and to the south of the city. The Cuzco and Lucre basins, however, are filled with riverine and lacustrine deposits, of which clays are a common component. Many clays, some riverine, are found further south.

It is a relatively easy matter to characterise chemically a clay deposit or the clay used to make a ceramic: numerous techniques exist (see, e.g. British Museum Occasional Papers, No. 19). Problems arise, however, when the archaeological material is compared with the raw clay, because chemically similar groups may be products of different processes. For geological samples, adequate sampling will show the relationship between groups based on particular criteria and different clay formations, or different parts of the same geological deposit. In archaeological samples, however, chemical and/or petrological characteristics may be artificial, deriving from potting practice: in which case, groups may be technological, the products of similar, human processes operating on material which may have been geologically disparate (see discussions in Blackman 1981; Schubert



1986). It may seem reasonable to assume the extent of the potters' alterations, or to assess it empirically (Blackman 1981; Davidson 1981), but, in making comparisons, there must then be an independent reason for thinking that a particular geological source was used in the first place (e.g., proximity to the site). In the present case, it is clear that clay which is suitable for potting or which could be made suitable easily, is ubiquitous (see Appendix 3), and there are no good, independent reasons for thinking that any specific local source was ever used at all, or that any other particular deposit was preferred, amongst the thousands in the valleys of the Andes. Petrological examination and experiment (see below and Appendix 3) indicated that most of the archaeological fabrics had been refined to some extent. It was clear, then, that in order to make any authoritative comments about sources, a large number of analyses would have to be done, and money and time did not permit this. Potting practices themselves were of more immediate interest, and to understand them, coarse composition was of more value than elemental analysis (Arnold 1978; Schubert 1986).

## 2. Fabrics and temper

The fresh fracture of every sherd was looked at in the field. A sample of sherds was chosen to study (see Chapter 4). Their fabrics were studied with a X10 and X20 hand lens, and the following characteristics were noted: colour of both surfaces and the cross-section (Munsell); hardness (Moh); appearance of the fresh fracture; inclusions: quantity, size and shape; and size distribution, distribution and orientation in the clay matrix. In the laboratory,

215 sherds were chosen for thin-sectioning, being representative of the fabrics of particular wares. In the interests of identifying the range of characteristics of the more common and important wares (e.g. Ware 13, Ware 45), and with limited time, some other wares were either not sectioned at all, or only single examples were examined. The thin sections were studied using a Zeiss Amplival polarising microscope, and the inclusions were identified petrologically. 1000 points were counted for each section. Technological observations were made: temper was distinguished (see Chapter 4); and finishing techniques were observed: a) distribution and orientation of particles at the surface, deriving from smoothing and/or 'wet hand' finishing (see Glossary); b) facets deriving from trimming or polishing, their profiles characteristic of particular tools and their handling; c) the application of slips, visible as isotropic layers on the surface of anisotropic bodies.

A small number of sherds thought to contain 'grog' as temper were subjected to cathodoluminescence, but both true grog and pellets of natural, fine clay (see Appendix 3) luminesced, and could not be distinguished from one another. A sample of twenty sherds was analysed by X-ray fluorescence, to see if the major fabric groups could be distinguished: if so, this might have provided a relatively quick and sure way of sorting a large sample from the collection which was not studied; but the results were judged to be not useful in this way.

The major rocks used to temper the archaeological fabrics in lude shales, andesites and trachy-syenites. Shales and sandstones comprise the major bedrock formations upstream from Cusichaca, south of the Huayllabamba fault, although few secondary clays in the vicinity, or further downstream, contain clasts of either. Carbonaceous shale is common in some Cuzco formations (Gregory 1916). Slate and shale is used at present to temper cook-pots on the Altiplano, but the particular sources have not been identified.

Trachy-syenites are absent in the Cusichaca formations. Fragments occur in secondary clays in the Ollantaytambo area, and were identified in a clay of unknown derivation from Chincheros. Gregory (1916) refers to syenites in formations also containing andesites in Cuzco (e.g. in the Pachatucsa formation). These igneous formations outcrop sporadically in Cuzco, in the Cuzco and Lucre basins, and to the south, at least as far as Tinta. Andesite is absent in Cusichaca, although rare nodules occur in the moraines; none was seen in the secondary clays. Gregory refers to its appearance in Late Tertiary formations in and to the south of Cuzco, resulting from one simultaneous volcanic outflow. Rumicolca, 35 km south of Cuzco, is the largest outcrop, and was quarried from at least the Late Horizon Period by the Incas, and up to the present day (see Chapter 4).

The outcropping of andesite is therefore fairly restricted, and eventually it will be instructive to compare the andesite and trachy-syenite archaeological temper with bedrock samples containing both. For the andesite temper, at least, it is reasonable to think that a

bedrock source was used in most cases, not an andesite-rich sand or field nodules, because the temper fragments are very fresh, petrologically uniform, and there is no other added component. The trachy-syenites are of unknown origin, and are sometimes associated in the archaeological fabrics with small quantities of andesite, not always fresh.

### 3. Pigments

Perceived pigment colour is caused by one of five things, or a combination of them: the chemistry of the pigment medium; a chemical interaction between the medium and the binding agent and/or the underlying surface; the preparation and application of the medium; the firing conditions. The aims of these analyses were to identify the contributing factors, to assess their consistency within certain ware categories, and to see if any exotic materials were present which might indicate trade.

All painted sherds were examined in hand specimen, using X10 and X20 magnification, and the following characteristics were noted: colour consistency; depth of the paint layer; presence/absence of a natural lustre or one produced by polishing; coating qualities, differences in texture and colour between the surface of the pigment and its underlying layers; discolouration of unpainted surfaces around the pigments.

A major difference became immediately apparent, depending on whether the pigment had been applied to a slipped or unslipped

surface. In the former case, even if the pigment were thin, the paint stood up from the surface, all the visual characteristics could be noted, and pigment could be removed cleanly for analysis. In the latter case, the pigments seemed to have been absorbed into the underlying surface, so that it looked as if the surface itself were discoloured, rather than that it carried a layer of paint. In these cases, few observations could be made. Because the presence of a slip, be it coloured or a 'self-slip', is characteristic of particular wares, this introduced an unavoidable sampling bias.

A small sample of pigments was studied by refiring under controlled conditions, by X-ray diffraction, and by using the scanning electron microscope. During removal of the pigments for analysis, the following characteristics were noted:

white pigment (Ware 13: 7 samples; Ware 29: 1): creamy-yellow to dead white colour; no surface lustre *in situ*, despite signs of compaction; (crumbly) sticky texture during removal, the pigment forming long curls; uniformity in all characteristics through the paint layer; thick application; no local discolourations.

black pigment (Ware 13: 3 samples; Ware 40. 1; Ware 45: 1): dead black to red-black colour; a slight natural surface gloss *in situ*; the surface hard, crust-like, and the pigment below softer, more powdery, redder in colour; some local red-brown discolouration.

red pigment (Ware 13: 4 samples; Ware 27: 1; Ware 40. 1; Ware 45. 1): all samples had been polished, and *in situ* had a metallic sheen; in colour, scarlet to terracotta to dark rose-red with a purplish hue variations dependent on the extent of oxidation of the underlying

body, the darker and more purple colours appearing so partly because of an incompletely oxidised surface beneath: after removal, the pigments were all similar in colour; a few less oxidised examples resembled in colour and in texture the 'black' pigments.

Samples of the unpainted bodies were removed as controls.

X-ray diffraction was unsuccessful, because too much iron was present, either in the pigment media, or as (unavoidable) contamination from the body, or, perhaps, from the binding agents. Both red and black pigments had very similar spectra, but those of the white were unique.

The S.E.M. analyses produced the following results: the three elements which vary most, and systematically, and whose relative proportions are probably responsible for pigment colour are iron, calcium and manganese. The white pigment is most probably derived from a virtually iron-free clay; a platey structure is clearly visible at X5000. Calcium is present, in higher concentrations than in the red and black pigments; iron and manganese are present too, but in extremely small quantities. The red pigments are iron-rich, with low/no calcium or manganese. At X5000, these pigments have a coarse, fibrous texture, and occasional platelets are visible. The black pigments have higher concentrations of manganese than the red. Iron is common; calcium very low or absent. At X5000, the structure differs from that of the red pigments; no platelets are visible, the texture is fine and homogeneous, with few/no pore spaces.

Therefore, the colours seem to be the products of the relative proportions of only three elements although, in the case of the black and the red, the proportional differences are very slight indeed. Because particular motifs in the Cuzco Inca repertoire were obviously always intended to be a certain colour, it is easy to see when the potters (or painters) miscalculated: an all-over slip shades from purple to black; rows of pendant triangles are dark red against a slightly lighter red slip. But this is rare. More variation is found in the pre-Inca traditions, where red and black commonly blur into one another, via a pallet of browns, and it is often difficult to tell the original intention. It is possible, therefore, that red and black pigments were often obtained from similar media.

No control was exercised in the actual firing: the pigment minerals are preferentially in a fully oxidised state (see below). But in Inca fine wares, at least, the black pigment is much finer-textured than the red, although whether this was a deliberate policy to control colour, or characteristic of the raw material, must await further analysis.

Refiring experiments under oxidising conditions produced no changes at all in colour. Under reducing conditions, all the underlying bodies greyed; black and white paint remained unchanged, and the reds greyed, the speed of the reaction varying significantly with the extent of surface compaction/polish. This suggests the way in which a grey(white-grey) pigment colour may have been produced on an otherwise fully-oxidised ware, Ware 24. This pigment was probably

derived from kaolinite, containing a little iron. In all cases where I have recognised it, this pigment has been heavily polished/compacted, which may have inhibited oxidation after an initial reduction firing: the timing would have had to be carefully controlled, so that the body and other unpolished pigments alone became oxidised during the second part of the cycle.

#### 4. Firing temperatures

'Heat work' is the effect a particular firing has on a particular combination of raw materials. Causes and effects are quite difficult to unravel: to some extent, the consistency and efficiency of firing practices can be assessed by simple observation, which may be of more value than trying to distinguish the role of individual agents.

The effective properties of a firing are structure of the fire; fuel; duration; presence of oxygen; temperature gradient; and highest maintained temperature ('HMT'). Among the characteristics of a pot which influence the effectiveness of heat work are shape and wall thickness; extent of surface finish and paint or slip; clay composition; and fabric texture. The more obvious effects of these combined agents on a piece of pottery include hardness and 'ring', and the extent of oxidation through the body.

The effect of the 'HMT', if it were high enough, can be observed sometimes in the extent of vitrification of the clay minerals of the fabric. This 'HMT' may not have been critical in actual workshop practice; and a high temperature may not have been necessary for a



'good' firing, particularly for temperature-tolerant earthenwares. In any one workshop, the HMT may not have been a consistent characteristic at all, particularly if the direct means of measuring it were lacking. But it seems likely that, if a particular set of firing conditions were repeated time after time, then the HMTs would be within a restricted range. So, if the extent of vitrification were of the same order throughout a category of pottery, and if the other visible effects of heat work were the same too, it would seem reasonable to assume a degree of consistency in pyrotechnology. And if consistency within definable limits could be recognised in different categories of pots, then this would provide a basis for discussing different ways of firing. If, however, the extent of vitrification were similar for all categories of pots, it would not be possible to say that all the firing methods were the same, but only that the methods had the same effect.

The onset and extent of vitrification can be observed under high magnification; furthermore, if control samples of the same fabrics are refired to known temperatures and then compared with their originals, the original HMT may be inferred, provided that vitrification is sufficiently far advanced and that the stages in the vitrification process of that particular body are sufficiently distinctive (Tite and Maniatis 1981). For actual temperature assessment, other techniques exist too, all dependent on recognising distinct phases in the clay minerals or in the non-plastic inclusions (e.g. Blackman 1981, Matson 1965; Morariu *et al.* 1977, Varashina 1981).

None of the fabrics in the collection were porcelains or stonewares; no pots were deformed; in thin-section no fabric was vesicular, no clay (other than that of slips) isotropic; in X-ray fluorescence (see above) no high temperature mineral phases were identified. Therefore, it was unlikely from the outset that any of these earthenware pots would have been fired above 1000°, and therefore that vitrification effects would be slight.

The samples were chosen from wares which showed the greatest internal consistency in hardness and extent of oxidation, and which differed most in these ways from one another: Wares 13 and 54 represented the two extremes, with Wares 9 and 29 as intermediates. A series of chips from the sherds were refired in 100° stages, from 600° to 1000°, for an hour each time under oxidising conditions. These controls and their originals were scanned using the electron microscope, and photographs were taken at X1200 and X1500 magnifications.

As anticipated, none of the original sherds is likely to have been fired above 900°C. At 900°C and 1000°C all of the refired chips show slight vitrification effects. Only one original sherd, from Ware 13, shows any such effects, and these are very slight and do not extend over the whole surface. This is similar to one of the Ware 13 chips, refired to 900°C.

Thus, apart from demonstrating that all of these sherds could have been fired in bonfires (see Appendix 3), the results are not

helpful as far as contrasting the pyrotechnology of Wares 13 and 54 are concerned. With one solitary example, there is no reason to think that the Cuzco Inca fine wares were 'better' fired, if the HMT is taken as a measure.

### APPENDIX 3. Experimental work

#### 1. Introduction

Clay deposits in the Cusichaca drainage system were located and sampled; a few clay samples were collected from the Urubamba valley above and below the Cusichaca confluence, from Ollantaytambo, Chincheros, Raqchi and Chocamarca (see Appendix 2, Appendix 6 and Appendix 7, maps 1 and 7). Suitable tempering material was collected from the Cusichaca (river sand of different grades) and from Raqchi (andesite-rich sand and nodules of andesite). The clays were processed in various simple ways, following traditional Andean procedures. The resulting fabrics were used to make test tiles, which were fired in bonfires constructed in the traditional way. Then a series of pots in Forms H and J were made and fired.

The details of each experiment (geological derivation and characteristics of each clay *in situ*; use by local inhabitants; weights of clay samples before and after processing; quantities of temper added; weights and colours of test tiles before drying out, before and after firing; quantities of fuel; temperatures in the bonfires; constructional and other details about each bonfire; details of the manufacturing experiments, successful and otherwise) are in the archives of the Cusichaca Project, and some will be published in due course. Here, for reasons of space, I shall only present those results which are relevant for the main text. Analytical methods are described in Appendix 2.

The purposes of the experiments were:

1. to see what access a hypothetical pottery in the Cusichaca valley would have had to suitable clays, or to clays which could have been made suitable for potting;
2. to compare the processed fabrics with their unprocessed progenitors, as a control over the identification of source areas,
3. to see if known processing methods, including addition of temper, could be identified after the event by looking at the fired fabrics;
4. to see if, by using local and other materials, we could mimic any of the archaeological fabrics in a really convincing way;
5. to observe the appearance of clays and fabrics after firing, and to distinguish those effects which were by-products of the firing process;
6. to assess the conditions (duration; temperature; fuel type, amount, and condition; stacking arrangements) needed to fire successfully;
7. to test the evidence for the way an Inca pot seemed to have been made by repeating the process;
8. to see if the experimental manufacturing method prescribed the shape and size of the pots in any way;
9. to see if the details of the experimental manufacture and finishing left identifiable traces.

## 2. Clays

No pots are made now in Cusichaca. Local informants showed us a number of primary and secondary clays, used for low-grade domestic

purposes (see Appendix 6). Other clays were found by us (see Appendix 2).

Bennett and Bird (1949, 245-6) refer to the ubiquity of good potting clay in Andean valleys. Within a day's walk of Cusichaca, fourteen different clays were found, all of which could be used to make and fire pots. Reasons why particular deposits (by no means always the most adjacent), are used nowadays, seem to have little to do with the quality of the clays; they are to do with unrestricted access to a deposit over common land, or, more often, with a deposit's proximity to other items of interest: family members, outfields, other raw materials. Journeys made with a solitary purpose are quite unusual (see Appendix 6).

The deposits varied in extent, in unfired colour, and in homogeneity. All the clays contained well-sorted mineral grains and rock fragments, predominantly granites or derivatives. The effects of sieving and levigation could be recognised and distinguished, because the processes removed the largest inclusions, and there was a sharp cut-off point in size. Comparing the residue with the refined clays showed that neither process was mineralogically selective (contrast Rye and Evans 1976, 129), except for biotite mica, which became more concentrated in the finer fraction. But the small, remnant inclusions in the refined clays were either single grains or small, very rounded clasts, whereas the larger clasts in the residues were much more angular. Clay pellets were a common component of all the clays, and

resisted processing and kneading (compare plates 2a, 10; see Appendix 2).

The clays fired across a range of colours (see 4, below), from a dark orange-brown (mainly the clays from the lower Cusichaca) to a pale cream or creamy-rose (the clays from the upper Cusichaca and from the Urubamba). Several tiles (see 4, below) came from the fire with a very pale surface resembling a slip (see Matson 1971, 66). Many of them had dried with a natural surface gloss, which survived the firing. The Raqchi clays fired a bright pink-orange.

### 3. Fabrics

Several of the local clays resembled the granitic and quartz-rich archaeological fabrics, but the similarities were not striking enough to prove that local materials had been used in the past. The fabric made by the modern potters of Raqchi (see Appendix 1-1, Sample 176) is visually similar in hand specimen and thin-section to that of Vares 13 and 15. No clays naturally resembled those archaeological fabrics which contain both andesite and trachy-syenite: the only way to mimic the fabrics of Vares 29 and 66 was by combining clays and temper from quite different sources: but then our information about clays in the Cuzco region is woefully inadequate (see Appendices 3 and 6 for further discussions from different points of view).

### 4. Pyrotechnology

A number of test tiles were made, using the processed clays, with and without temper. The bonfire structure was the same each time,

based on Andean prototypes (see fig. 22, plate 13, p.245, and Appendix 6 ; the fuel was all of the same type, and similarly dry; in line with non-mechanised Andean procedure, a fixed quantity of fuel was kept by to add to the fire each time the flames broke through, and the consumption of all this fuel marked the end of stoking. Two thermocouples attached to a pyrometer were used to measure temperatures of the fires in the centre (just below the tiles) and on the edge (amongst the tiles).

In the early stages of each firing, the temperature gradients in the two areas of the fires were wildly different; on the edge, temperatures rose, and fell again, rapidly; in the centre, the temperature crept up gradually. Only after stoking was complete did the temperatures equalise, and they crept up further to peak some time after the stoking was finished. Again in line with Andean procedure, the fire was left until all the embers had died out.

The measurable variables in the fires were time taken to consume all the fuel (from one to three hours); both sets of temperature gradients, which differed every time, and the highest maintained temperatures, which varied from 632° to 852° (peaking on one occasion to over 900°). Wind strength and direction were the major cause of the variations, but even slight differences in dryness of fuel or stacking arrangements (not deliberate) seemed to have an effect.

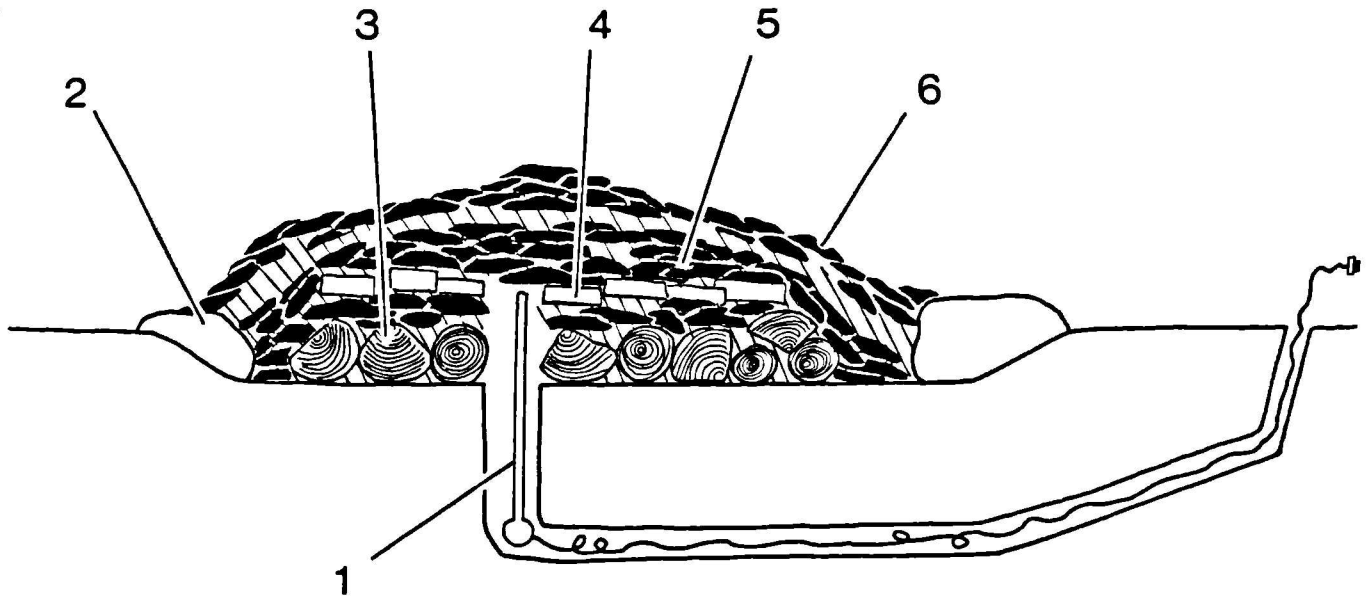
The only requisites for the successful firing of the tiles was a temperature in excess of 600°, maintained for a minimum of 20



## Cross-section through experimental bonfire

- 1: thermocouple rod, and lead to meter  
2: stone curb

- 3: log platform (eucalyptus)  
4: tiles, pots  
5: cow dung patties and straw  
6: covering of cow dung patties



Experimental bonfire after removal of pots, showing discolouration of stone curb and complete combustion of fuel, leaving a fine, powdery ash.



minutes. If these conditions were met, both tempered and untempered tiles survived the firing, fired completely, and all were oxidised. No observable differences were detected on the surfaces or in cross-sections (see Appendix 2) if the tiles were fired for longer or to higher temperatures, although the tempered tiles oxidised completely in a slightly shorter time than their untempered counterparts. No systematic differences could be detected between tempered and untempered tiles fired at sea level, in Cusichaca (8000 feet OD) and in Cuzco (12,000 feet OD).

The fuel was dried cow dung. This was obviously calorific, and burnt with a clear, non-smoking flame. It burnt through completely (see plate 13), but retained its structure to the end, provided that it wasn't prodded; this meant that the bonfires did not collapse, and there was no (or little) free carbon to smudge the clay surfaces. It was extremely difficult to create a reducing atmosphere, and extremely easy to oxidise even an organic-rich clay completely.

The major differences between these experiments and a modern Andean potter's firing are a) in the latter, pots are stacked in such a way that they form a solid cone of wares, virtually a kiln in their own right. This may raise temperatures and stabilise conditions, at least for the pots in the middle; b) tiles are not pots: whereas our experiments were successful, in terms of complete, oxidised tiles, the variations in the bonfires might have proved deleterious to pots, no matter how well stacked; and c) llama, not cow dung is used by modern potters: recent commercial experiments in the (deforested)

Altiplano have shown that alpaca and llama dung are more calorific than cow (pers. comm.).

5. Manufacture (see Appendix 1-3, fig. 3a, 3c)

A fabric was used which resembled that of Ware 13.

**Form H**

Homogeneity and plasticity of fabric were important if coils were to be formed and bound together effectively. Even in the shade, the clay dried out very quickly (see below), which meant that manufacture had to be rapid.

It became clear that parts of the profile, particularly that of the base with its shallow flare and characteristic inflection above the point, derived directly from the necessity of supporting the point, and from adding increasingly longer, wetter (and therefore heavier) coils to a thumb-pot base as the shape grew. The walls automatically flopped outwards over the support under their own increasing weight. The only way to mimic the overall profile was to construct the pot in segments, and allow each to dry out completely before assembly. A (previously undetected) major join had to be made in the upper body because, to achieve the correct, sharp angle between neck and shoulder, the neck/rim segment had to be attached on the inside of the shoulder segment. The major join in the upper body was the last and, unlike all the others, had to be made edge to edge or on the outside, and had to be filleted (archaeological breakages occur above or below the fillet, and not at the join itself). The

upper body could be made upside down, as a bottomless bowl, in the same way as the lower body: curvature of upper and lower bodies were therefore similar, which may have been of advantage in stacking the finished pots in the fire or for transport. The handles on the lower body span another major join. A rope passed through these handles and over the triangular knob below the neck crosses the coils diagonally and spans the two major joins in the body (all planes of weakness, even in a fully-fired pot).

#### Form J

The profile was achieved by coiling from the base upwards, in two stages. It had to be done this way, in order to support the weight of clay forming the dramatic outward flare, but it meant that the inflection in the walls, characteristic of the form, developed naturally.

Both forms were finished by polishing. This was done with diagonal strokes, and apart from flattening the surface parallel to the coils, this pushed the coils together. Surface mica, natural to the clay, showed up in a very striking way.

Not all of the experimental pots fired successfully. There was no complete disintegration or spalling, but bases had a tendency to part company. The breakage pattern of archaeological samples shows that the base/wall conjunction was always fragile even after firing, not necessarily because of particular kinds of usage, but because of an

endemic structural weakness combining weight of body and abrupt change in profile.

#### APPENDIX 4. Form codes

The major forms of Cuzco Inca pots have been described by Valcárcel (1963), and re-illustrated and described by Rowe (1944). Menzel has described and illustrated the forms of both provincial pottery and the Cuzco Inca imports for the Late Horizon Period at Ica, and for earlier periods (1976), and Meyers has done the same for Late Horizon Period pottery in Ecuador, in great detail, and providing many references (1975). Dwyer has illustrated the Cuzco Killke pot shapes (1971).

Here, I am not analysing the forms as a separate category. Each major kind of shape is given a letter code, a descriptive name, and a very general description. Bracketed characteristics are those which vary most, ware by ware: I describe here the most common version. Where there are obvious equivalents in the literature (see above, and Kaufmann-Doig 1978; Morris 1985), I list them.

The formulations and sizes peculiar to a ware are described in Appendix 1, as are manufacturing methods, functions of the pots and the degree of confidence with which a whole shape can be reconstructed from a small fragment.

A. 'olla' or 'cook-pot' (Appendix 1-3, figs. 1a, 6a, 6b; plate 1a)

Wide mouth; everted rim; no, or short, neck; globular body; [round] base; two opposing [horizontal] strap handles on the shoulder.

Mayers: d/9

(Morris: form 3).

B. 'long-necked jar' (Appendix 1-3, figs. 11, 16, 20)

Narrow mouth; everted rim; long, narrow neck; globular bodies; [flat] bases; [handles].

A form with plenty of variations, some specialised (e.g. H: see below). Menzel, Mayers et al. distinguish various kinds of 'jars' and 'bottles'. Lacking any complete examples in Cusichaca, it is impossible to tell if such distinctions apply here.

C. 'angled bowl' (Appendix 1-3, fig. 1b)

Open mouth; lip not thickened; [rounded off] at the top of the wall; wall below vertical; a distinct angle where the wall begins to curve round to the base; flat base; [handles or lugs on lip].

E. 'pedestal bowl' (Appendix 1-3, fig. 2; plates 2b, 2c)

Wide mouth; everted rim; no neck; swelling body with a clear carination where the wall curves in to its base; base of body sits on a pedestal with a stem, which flares widely at its base; one horizontal strap handle on shoulder, looping upwards above the rim.

Menzel: 245

Mayers: e/10

Morris: form 7

Rowe (Valcárcel): j.

F. 'sieve' (not illustrated)

Open mouth; [rounded lip]; curving walls and base, making a shallow bowl; numerous perforations made with a [small] twig or bone, after drying-out of the pot.

Some authorities refer to perforated forms, but they do not seem to be of this shape.

G. 'lipped bowl' (Appendix 1-3, fig. 12f)

Body profile as K; lip turned in and flattened, forming an [overhanging] ledge on the inside.

H. 'aryballus' (Appendix 1-3, fig. 3a; plate 6b)

A specific variant of B; two opposing perforated lugs below the rim on the outside; a triangular knob just below the neck/shoulder junction, equidistant between the lugs; two opposing strap handles on the lower body, positioned beneath the lugs; maximum girth of body at, or just above, the junction with the base; the base slopes in to a pronounced point.

e.g. Kaufmann-Doig: a

Meyers: a/1

Morris: form 1

Rowe (Valcárcel): a.



J. 'plate' (Appendix 1-3, fig. 3c; rim profile in plates 4, 7)

Open mouth; no distinct lip; walls flare outwards from small, flat base; [modelled and/or other handles on lip].

e.g. Kaufmann-Doig: p.727, 728, 729

Menzel: 250

Rowe (Valcárcel): g

K. 'bowl' (Appendix 1-3, figs. 3b, 5, 15, 19)

Open mouth; no distinct lip; concave body; flat base.

L. 'handled bowl' (Appendix 1-3, fig. 8)

Wide mouth; everted rim; no neck; globular body; flat base; two opposed horizontal strap handles on the upper body.

e.g. Rowe (Valcárcel): f

M. 'thick-rimmed jar' (Appendix 1-3, figs. 7a, 12a, 14a, 16)

Narrow mouth; everted rim, much thickened below the top on the outside; neck narrow, length variable, swelling out gradually into a globular body; [flat] base; [vertical strap handle(s), from rim to lower neck/shoulder].

e.g. Dwyer: no. 288 (and compare no. 289).

N. 'dish' (Appendix 1-3, figs. 7c, 14b, 18b; plate 11b)

Open mouth; no distinct lip; no curvature in walls, which flare outwards from flat base; [double lugs on lip].

Dwyer: no. 293.

APPENDIX 5. Decoration codes

I have not attempted an analysis of artistic style by enumerating the motifs in detail, tracing their developments, manifestations and several relationships, or by discussing any meaning a design may have had (i.e. the potential scope of design analysis as described by Frankel 1975, and Plog 1980). This would be difficult with sherds such as these, and in any case, my aim has been in a different direction.

Accordingly, these decoration codes are used to describe the major kinds of designs, in terms of their geometric or cursive nature and the number of pigments used, in the most general way. More than one kind of design may appear on a pot (particularly on the sharply-accented Inca shapes). Most designs are linear, non-figurative patterns which cover large areas: isolated motifs are rare, unless enclosed within a continuous pattern. Most design lay-out is vertical (some horizontal arrangements on necks) but within these major fields, there are usually strong diagonal elements. Four-square designs only occur on Ware 15. 'Curvilinear' in the sense I use it below, means that lines and bands undulate deliberately. Circles or ovals are always subsidiary motifs. For most designs, there are striking differences in effect produced by variations in pigment colour (see below) and texture, in line width, size of motif, and in the relative proportions of parts of the designs to one another, and of the whole to the pot. Some variations are not regular, and were

probably individual styles. Others are common to a ware, and they are described in Appendix 1-1. Dwyer (1971), Menzel (1976), Rivera and Rowe (1944), describe and illustrate the designs found on Cuzco Killke, Cuzco Inca and provincial wares of the Late Intermediate and Late Horizon Periods. I do not give Munsell colour codes here, or in Appendix 1-1. The range of pigment colours is large, but, as explained in Appendix 2, often this has little to do with original intention. A long list of Munsell codes would only complicate the issue. The coloured plates in Appendix 1-3 give a general impression of colours and tonal contrasts.

Painted decoration (coded B)

B1 Simple monochrome designs applied to a wiped or compacted body with no slip. Contrast pigment/body usually low (Appendix 1-3, figs. 14a, 14b, 18a; plate 9, right-hand side).

1A Black pigment: curvilinear motifs.

1B Black pigment: rectilinear motifs.

1C Red pigment: curvilinear.

1D Red pigment: rectilinear.

B2 Simple rectilinear monochrome designs applied to a self-slipped body. Contrast pigment/body usually medium to high (Appendix 1-3, fig. 12b, 12c, 13a, 13b).

2A Red pigment

2B Black pigment

B3, 4, 7 Bichrome designs (Appendix 1-3, figs. 4, 7, 9, 10, 12d, 12e, 17, 18b; plates 8b, 8c, 11b)

**B3 Red and black on a wiped or compacted body with no slip (cf B1).**

**B4 Red and black on a self-slipped body (cf B2).**

**B7 Red and black on a white or pale slipped body (cf B5 below).**

**3-4-7A Simple geometric/rectilinear designs.**

**3-4-7C Complex designs, including subsidiary, or individual motifs.**

B5, 6 Monochrome designs on a white or cream slipped body (see illustrations for B2).

**B5 White or cream slip alone.**

**B5A Red pigment, complex designs including subsidiary motifs.**

**B5D Red pigment, simple geometric designs.**

**B6A** Black pigment, as B5A.

**B6D Black pigment: as B5D.**

B9, 10, 11, 16, 21 Coloured slugs (Appendix 1-3, figs. 5, 19).

B9A All over red )  
 ) No overpainting  
 9B All over purple/crimson )

B10 Purple/crimson) overpainted in cream and black or red geometric  
B19 Red) designs

B11 Crimson )  
 ) overpainted in black: geometric designs, with  
 B16 Orange/yellow ) rare subsidiary motifs.

**B21 Crimson overpainted in cream: geometric designs.**

- B17 A self-slipped body, overpainted in cream and black or red: geometric designs.
- B20 A self-slipped body, overpainted in cream, black and red: geometric designs and subsidiary motifs (Appendix 1-3, figs. 3c, 8).
- B22 Red or crimson paint on rims only (plate 1a).
- B23 Black paint on rims only.
- B30 Other.

Plastic decoration (coded C) (Appendix 1-3, fig. 21)

- C1 Pattern-burnish.
- C2 Applied cordons, with incisions.
- C3 Incised lines.
- C6 Plain cordons.
- C7 Human or animal modelling.
- C11 Punctates.
  
- C15 other (e.g. stamped circles).

## APPENDIX 6. Ethnographic work

"Impressed by the possibility of a comparison, we think we are perceiving a state of affairs of the highest generality" (Wittgenstein 1958, note 104).

### 1. Introduction

Ethnographic surveys have been made by myself and by other members of the Cusichaca project in c.70 households in the Cusichaca and adjacent valleys; in the pottery-making villages of Raqchi, Machamarca and Tinta, c.110 km south-east of Cuzco towards the Altiplano; in Chocamarca in the Apurimac valley (Appendix 7, map 7); in the markets at Cuzco, Pisac, Chincheros and Limatambo (Appendix 7, map 7); at Sicuani and Pukara, c.210 and 300 km south-east of Cuzco on the Altiplano, in Puno on the north shore of Lake Titicaca and in La Paz (see frontispiece); and in Quillabamba, c.210 km north-east of Cuzco on the Urubamba-Ucayali river; and at the annual fiestas in Raqchi, near Maras north-west of Chincheros, and at the fiesta of El Señor de Huancár, south of Cuzco. Additional information came from Aguas Calientes below Machu Picchu, from Ollantaytambo (Appendix 7, map 7), and from potters and consumers around Lake Titicaca (see frontispiece).

The purposes were to locate the raw materials used by potters who work in traditional ways (i.e. without fast wheels or kilns); to observe how the materials were prepared, and the pots made, decorated

and fired; to record marketing methods; and to see how pottery was obtained, used and disposed of in households. Relevant surveys by others in the Andean area include those by Arnold (1985; and in press), Chavez (forthcoming), Linné (1925), Litto (1976), and O'Neale (1976).

Of the surveys made by myself and the Cusichaca Project, the complete archives are held by the Project, and some will be published in due course (e.g. Liebschner and Lunt, forthcoming).

In many Andean areas, it is not possible to trace a continuous pottery-making tradition as Techopik has done for the Aymara (1950). Characteristics of the modern situation, which separate it from both the historic and pre-historic, include the results of recent changes in demography (e.g. depopulation of the countryside), investment of money and foreign know-how in some of the larger potteries in order to provide work, mechanised transport, availability of non-ceramic products, and the tourist industry. All these have created a polarisation in the pottery industries and in markets: small, local potteries, productive in living memory, have since gone out of business (e.g. Aguas Calientes, Ollantaytambo); consumers are more likely now to go straight to the big markets for a whole range of products: these include longer-lasting containers of metal or plastic, or pots which have been mass-produced cheaply by the large industries with their extensive market networks. To survive, some potteries now make ersatz Inca and other wares exclusively for

tourists (e.g. Cuzco, Pisac, and some of the Sicuani and Pukara potteries).

It is interesting that pottery industries have responded so sensitively and rapidly to economic and to social changes (compare Arnold, in press). But the situations I describe here have no time-depth, or a very short one, and there is no control over their relevance for the archaeological evidence, with its long chronological perspective. As with most ethnographic data, the evidence threatens to become anecdotal only: and in the present situation, I have not tried to form a coherent argument, but to refer briefly to salient points which have relevance to different parts of the main text.

## 2. Informants

Each of the four pottery-making villages of Raqchi, Machamarca, Tinta and Chocamarca comprises from 20 to 50 potters, who work in their own compounds. In Raqchi and Machamarca, men make the pots, and on a seasonal basis. In part, this is because of agricultural commitments, but also because the rainy season makes potting difficult. During the pot-making season, however, it is a full-time occupation, and the men call themselves 'potters', not 'farmers who also pot'. In Chocamarca (and apparently in places on the Altiplano), women make the pots, and do so all year round. Potters at Raqchi, Machamarca and Tinta were visited in 1978, 1979, 1980 and 1981. During those visits, several potters' compounds were visited and firings were observed. Five potters in Raqchi were particularly



informative, displaying their skills and allowing samples of material to be taken away. Chocamarca was visited twice, in 1982 and 1983: during the latter visit, several potters and other informants were questioned, and firings were observed. All the markets have been visited on several occasions from 1979 to 1985, and numerous people were asked questions. The fiestas have been visited more sporadically. The Cusichaca households have been visited systematically and frequently, before 1978 by Kendall, and during the Project from 1979 to 1985.

3. Raw materials (see Appendix 3) (Raqchi, Machacamarca, Chocamarca)

Each village uses adjacent raw materials, which each potter collects for himself. Pigments alone are bought in. Every potter I spoke to referred to his own personal fabric recipe: in Chocamarca particularly, there is scope for individual variation, as four separate clays are combined to make the fabrics. Yet all the potters in each village produce the same 'village fabric' (e.g. Raqchi: Sample 176), and no systematic personal variations can be detected. Each fabric is relatively coarse-textured.

4. Manufacture and wares (Raqchi, Machacamarca, the Altiplano, Chocamarca)

The major pot-building techniques are the same in all the villages. Every potter has his own peculiarities in secondary techniques, but these are mostly to do with the way a pot is held or a particular finish achieved, and it is difficult to detect these personal variations in the finished pots (although the potters

themselves do so, and need to, in order to retrieve their own work from the communal firings in Chocamarca).

Most of the potters work on several pots at once, making them piecemeal (see plate 3). Each village produces 4 or 5 major lines, which every potter makes. The potters say that it is better to have a variety of shapes and sizes for stacking in the bonfires; and that you're more likely to do well in the market if you have a range of pots on sale. Only in Chocamarca did I see any independent, special production for a particular kind of market: those potters who could, were making figurines, lamps and toys for an annual fiesta. On the Altiplano, some potters make only cooking pots; even in Raqchi they buy in their ollas (Ware 8: see plate 3) from the markets at Cuzco and Sicuani, saying that their own clay doesn't make good cooking pots.

The wares of each village, even of those close together like Machacamarca and Raqchi, are easy to distinguish by fabric, shape, amount of decoration, and kind of motif. Even cooking pots are distinguishable: several changes can be rung on the basic theme of round body, short everted neck, and strap handles, in terms of proportions, treatment of the rim, and number of handles. Although my sample from each potter was small, personal variations seemed to be very slight.

5. Firing (Raqchi, Chocamarca)

All the pots are fired in bonfires. Pots dry out "for a few days", and there is no pre-firing. The largest fires comprise c.150 pots (Chocamarca, where it is the village custom to fire communally), the smaller from 10 to 20. Some of the individual Raqchi fires use permanent stone platforms or curbs (as in Appendix 3, fig. 22 and plate 13). Those in Chocamarca have no permanent structure or location. Dried llama dung is the major fuel, with straw to make the fire blaze. No other control is exercised in either of these villages during firing. Quantity of fuel dictates the duration of stoking: in no case was this longer than two hours. Temperatures were measured only at Chocamarca: the temperature in two firings rose rapidly to c.650° C on the edge of the fire, and was maintained, with little fluctuation, for the rest of the stoking period. All pots are oxidised. No pots blew completely in the firings which I saw, and marred pots could be sold. Ash is removed for fertilizer, or the wind blows it away, or animals wallow in it, and spread it around.

6. 'Markets' can be grouped under five headings:

- a) Personal/local exchanges.
- b) Buyers visiting the pottery *ad hoc* (rare: Raqchi, Pukara).
- c) Daily markets (Cuzco, Sicuani).
- d) Weekly markets (Cuzco, Limatambo, Quillabamba, Puno, Pisac, Pukara, Chincheros etc.)
- e) annual fiestas.

Apart from the special things made in Chocamarca, all potters make the whole range for each kind of market (i.e. c, d and e), and all the wares are sold together in the market places. Access to wares is not restricted at all, therefore, and consumers can stock up on anything in the range at any kind of market. It is rare for a potter to sell his own wares: normally there is a middleman, sometimes a relative. I observed no barter in the market places: all pots were sold for money, although, apparently, this is a new thing. Traditionally, market traders would exchange goods. Now there is a clearer distinction between the traders and the buyers.

#### 7. Household assemblages

In Cusichaca, pottery is present in households through one of four mechanisms:

- a) heirlooms: pots survive, more or less intact, for more than one generation. Places of origin and original purpose are usually unknown or mythical.
- b) personal journeys for reasons other than obtaining pots: these include family visits, both to and from, and marriages into the valley. Such journeys may be long ones. They are accompanied often by pottery changing hands as gifts or dowry, but almost always as containers of something of greater interest, such as alcohol or oil.
- c) personal shopping sprees for reasons other than buying pots. Upstream from Huayllabamba, people tend to go by foot on upstream into the Apurimac valley and thence to Limatambo to buy sugar,

salt, kerosene, etc. They visit villages on the way where they have family ties, in which case (b) above may apply. But until recently, some small potteries existed in the Cusichaca/Apurimac watershed area. Now, however, pottery is sold only in the market at Limatambo, and is usually bought to hold, or because it already contains, something else.

Downstream from Huayllabamba, people go to Cuzco, and the journey is made by train, or on foot to Ollantaytambo and thence by lorry or bus. For most of the journey, then, there is no personal choice about the route you take or what to buy where: you are taken to Cuzco, and buy what's on sale there in the market.

d) stocking up on pottery. This happens occasionally at the weekly markets, but much more so at the annual fiestas. There is always a selection from different places, and although the same is now true of the weekly Cuzco market, it is customary to buy pots on a special trip to a fiesta, when not encumbered with other things. In the Andes now, and even more so in the past, the quantity of domestic things in transit is limited by what can be carried on a human back (or, more rarely, an animal's: see Murra 1965, 185, for example).

Replacement rates of pottery in households are slow, and broken pottery is re-used (see Chapter 5). The only way to tell what a pot is being used for at the time is to look inside, or wait and see. Most households are small, and apart from the hearth, there are no permanent divisions into 'activity areas'.

The Cusichaca evidence must be treated with great caution. I have indicated above that a number of situations are new, of which the most significant, from my point of view, is that there is no potter in the valley, and no pottery on sale within a day's walk. The Cusichaca population is largely dispersed, and the standard of living low: lacking capital input, the land is marginal. Two post-Inca events, of great social and economic consequence, have created these situations, and isolate the modern population from their Inca and pre-Inca predecessors: the feudal system imposed by the Spanish (see, for example Spalding 1982), and the Agrarian Reform of the 1960s.

## Appendix 7. Maps and plans

I am very grateful to Dr Kendall for allowing me to use her maps and plans, all of them drawn by her, and published in Kendall 1976 and 1985.

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2. Barracks

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B17, B20 and A22 in shaded area: see Chapter 5, Section B.

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(Omitted numbers are those of sites not mentioned in my text: see Kendall, 1976 and 1985).

4. Q1, Q1E

5. Q2-1, 2-2

6. Q5

7. Q3

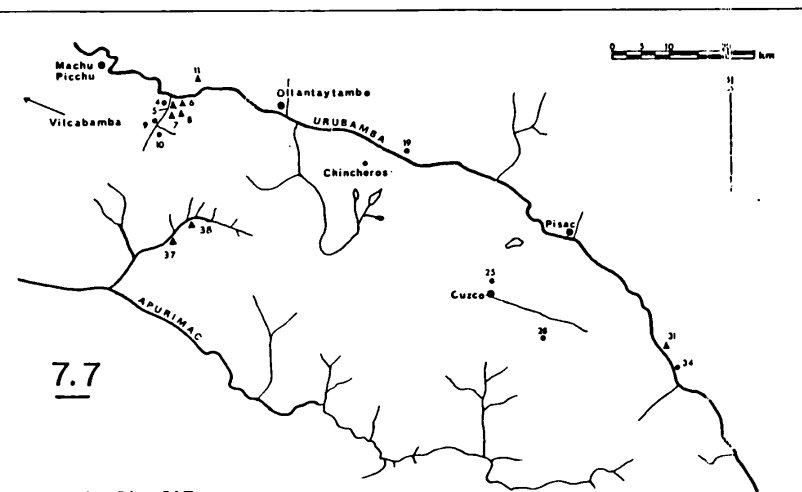
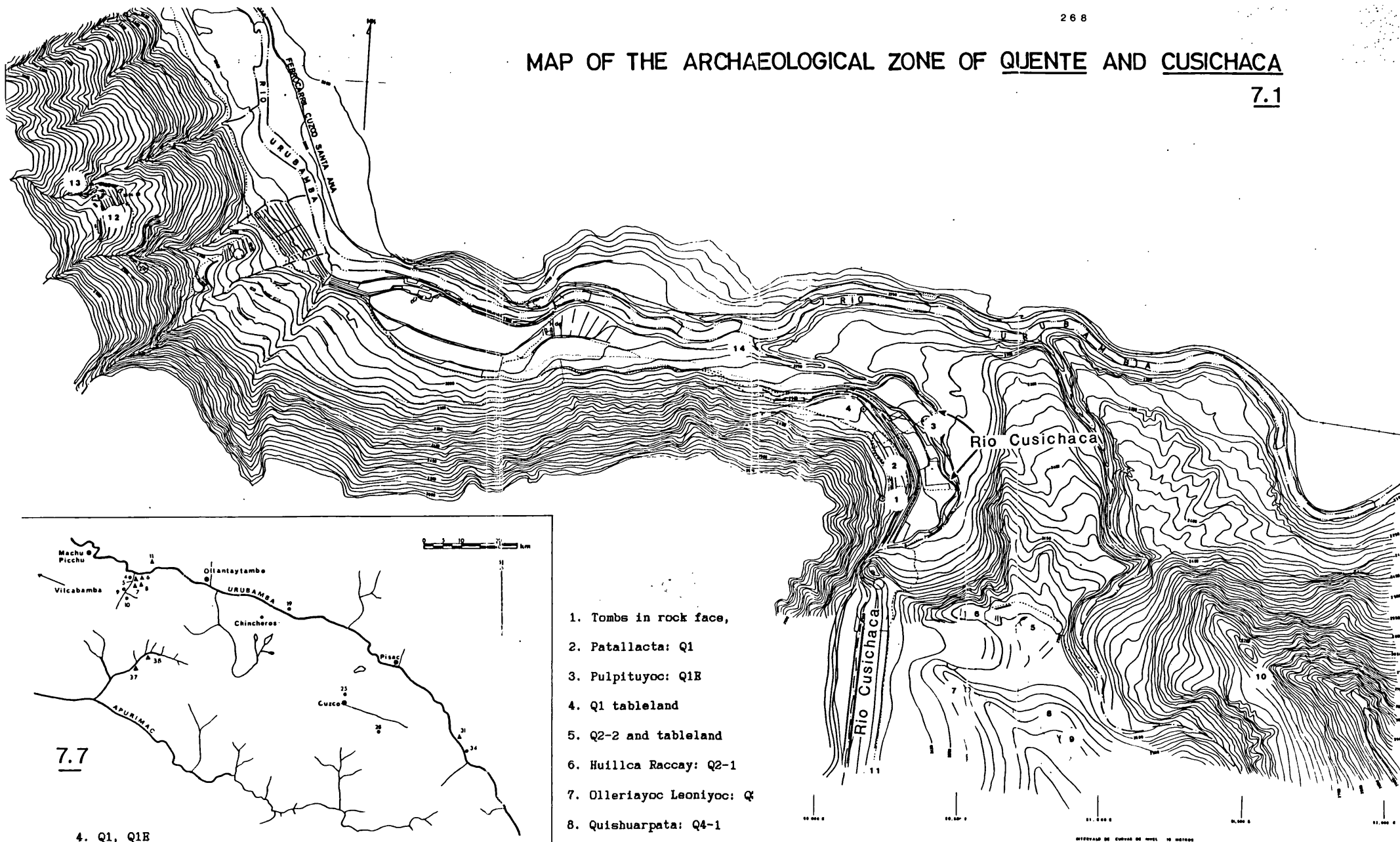
8. Q4-1, 4-2

9. Huayllabamba



# MAP OF THE ARCHAEOLOGICAL ZONE OF QUENTE AND CUSICHACA

7.1



7.7

- |                 |                  |                |
|-----------------|------------------|----------------|
| 4. Q1, Q1E      |                  |                |
| 5. Q2-1, 2-2    | 10. Paucarcancha |                |
| 6. Q5           | 11. Piscaycucho  | 31. Pikillacta |
| 7. Q3           | 19. Yucay        | 34. Rumicolca  |
| 8. Q4-1, 4-2    | 25. Sacsahuaman  | 37. Limatambo  |
| 9. Huayllabamba | 28. Paucaritambo | 38. Chocamarca |

1. Tombs in rock face,
2. Patallacta: Q1
3. Pulpituyoc: Q1E
4. Q1 tableland
5. Q2-2 and tableland
6. Huillica Raccay: Q2-1
7. Olleriyoc Leonyoc: Q
8. Quishuarpata: Q4-1
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12. Huayna Quente: Q10
13. Tombs
14. Urubamba-Cusichaca river confluence

10. Paucarcancha

11. Piscaycucho

19. Yucay

25. Sacsahuaman

28. Paucaritambo

31. Pikillacta

34. Rumicolca

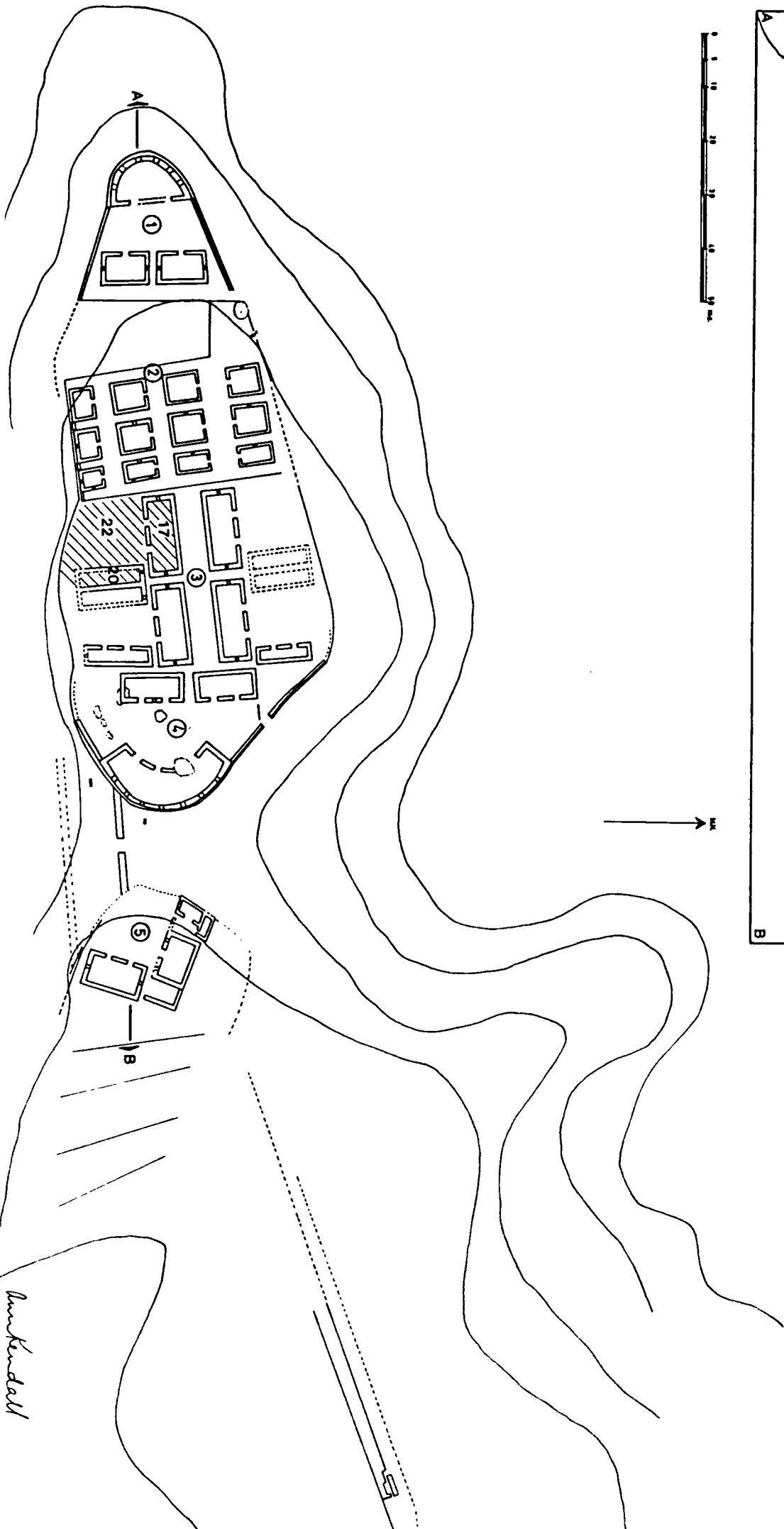
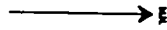
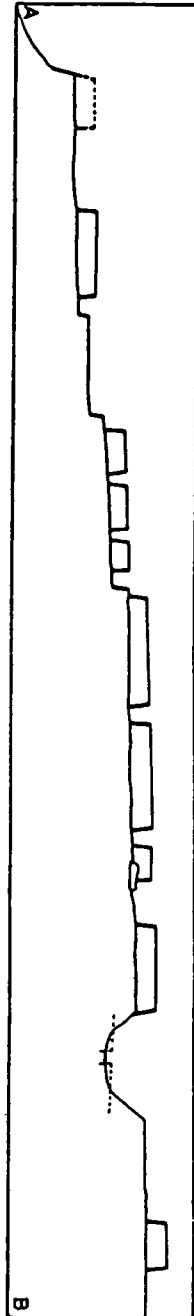
37. Limatambo

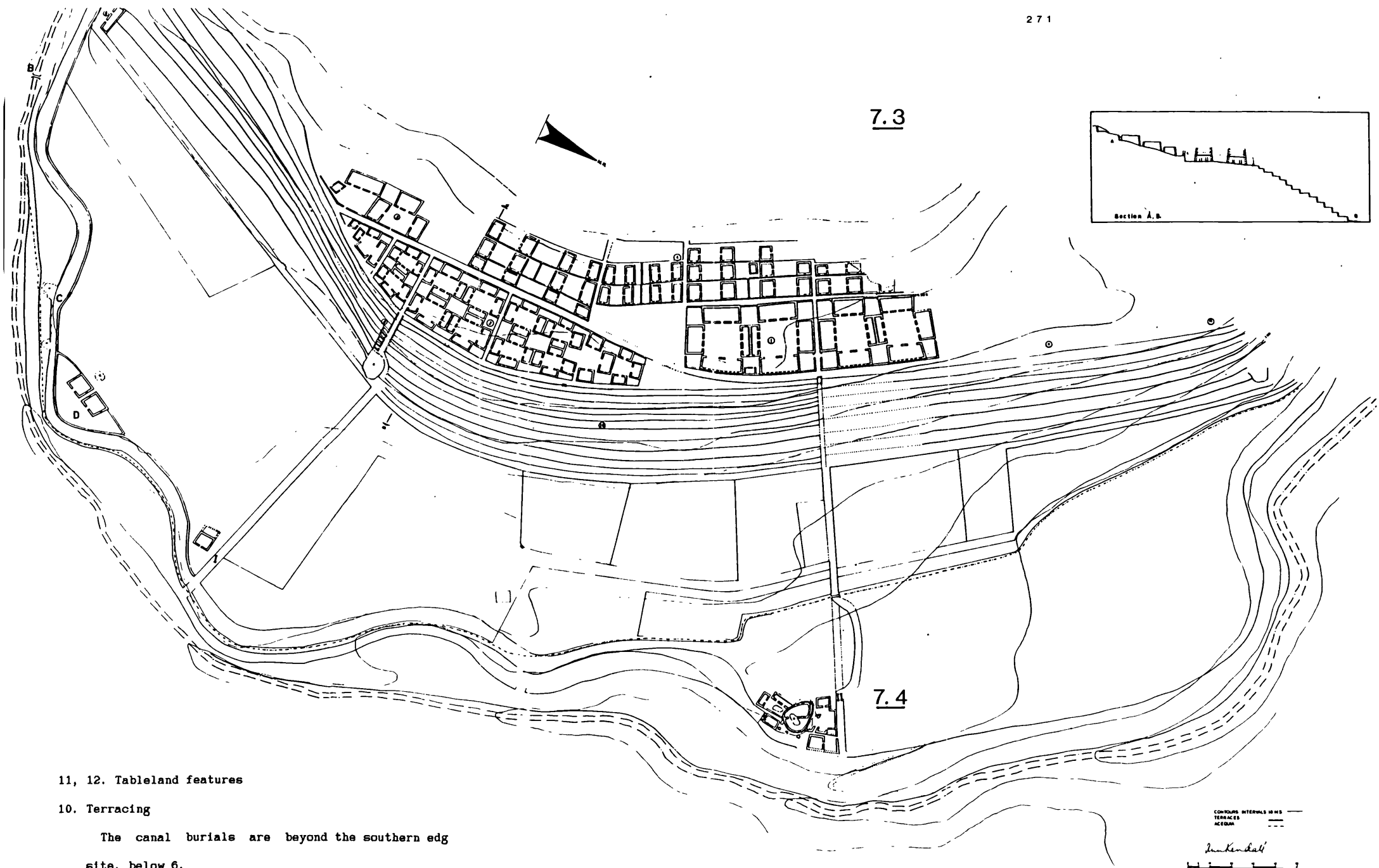
38. Chocamarca

# HUILCA RACCAY

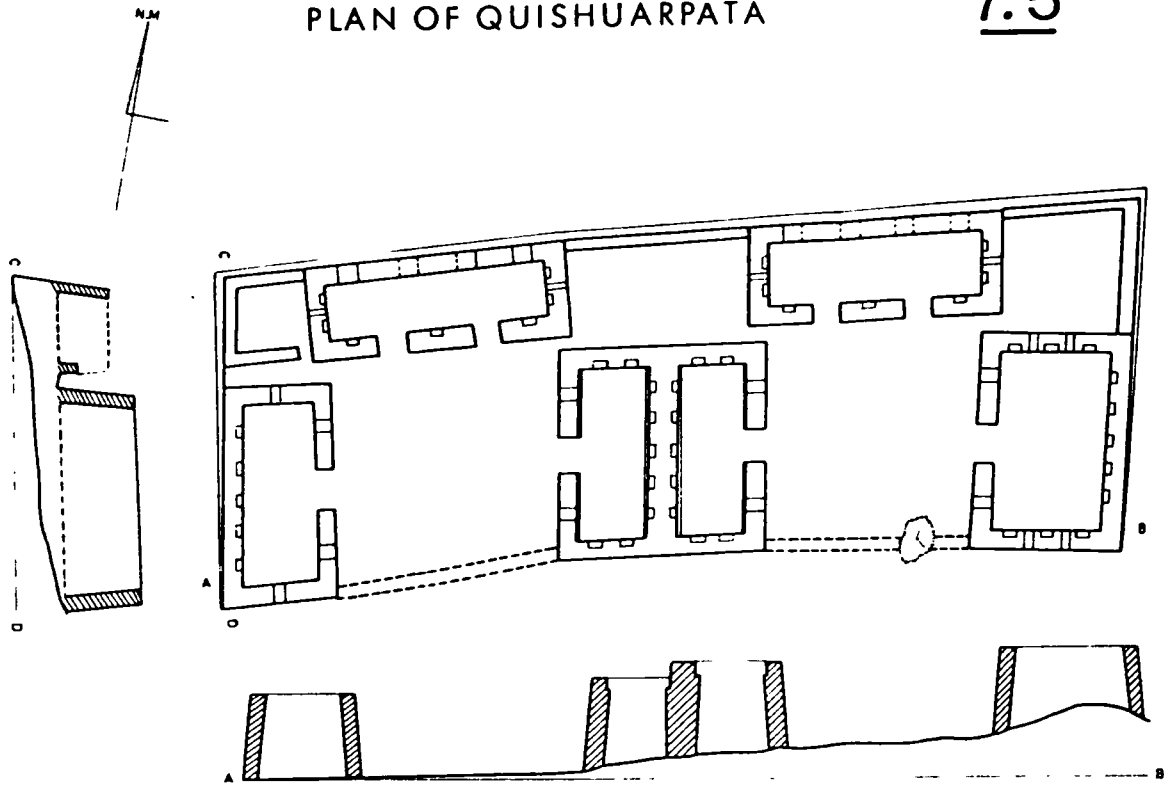
## 7.2

1. and 4. C.O. quarters and look-out
2. Barracks
3. Storehouses





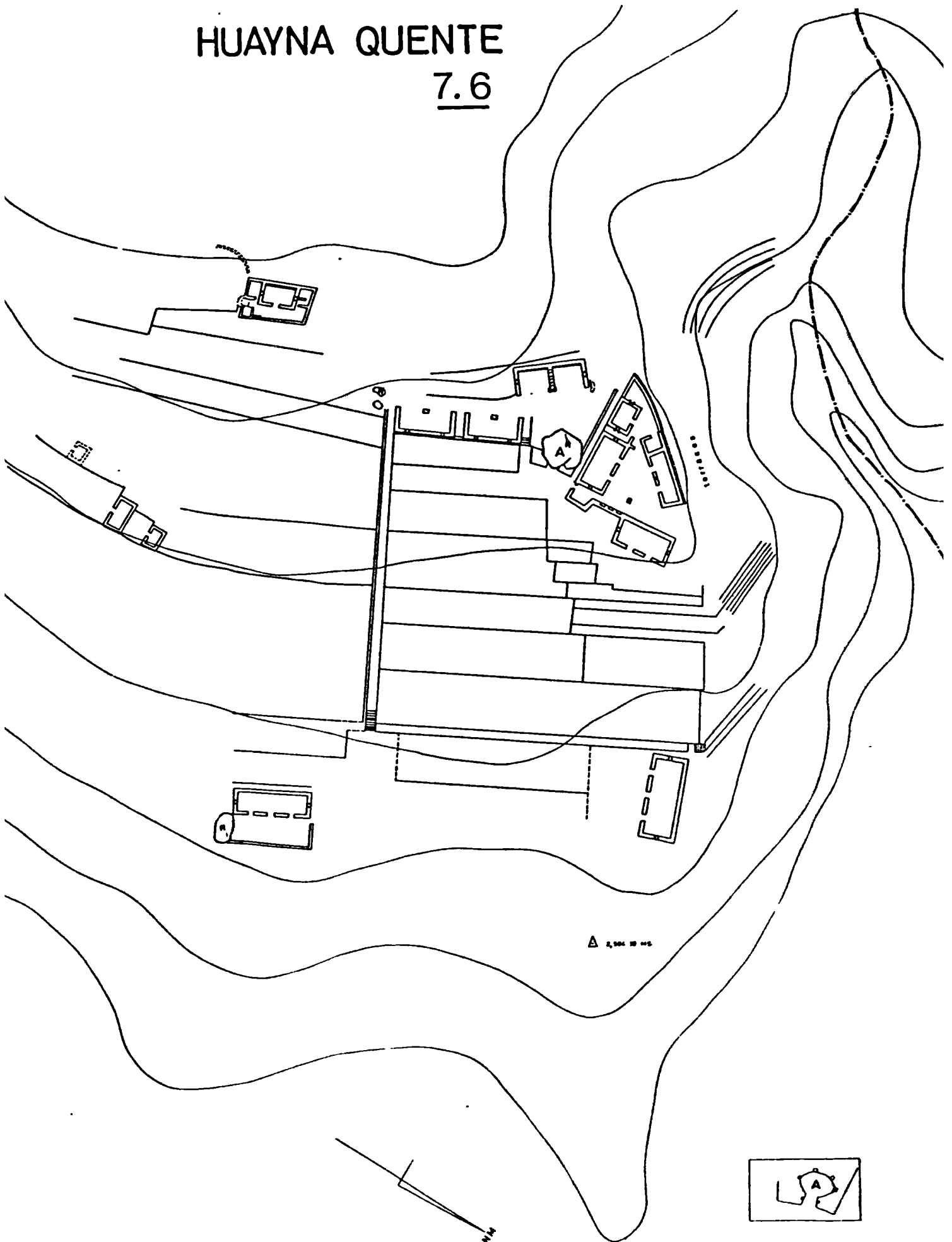
## PLAN OF QUISHUARPATA

7.5

0 5 10

# HUAYNA QUENTE

## 7.6



## APPENDIX 8. Comparative studies

### 1. Introduction (see Appendix 7, map 7).

Pottery was studied from excavations and surface collections made in the Cuzco area. It included samples from the 1982 excavations at Pikillacta, and from the surfaces of adjacent sites (submitted by Gordon McEwan); from the surfaces of sites and fields in and around Paucaritambo (submitted by Brian Bauer and Gary Urton); from the 1982 excavations at Ollantaytambo (submitted by Arminda Valencia); from surface collections made in Ollantaytambo and Cuzco by Barrera; and from the surface of the site at Piscaycucho (collections made by myself and Cusichaca Project members). I am most grateful to the archaeologists for letting me see their pottery, none of which had been published.

With the exception of the Piscaycucho pottery, all of the sherds arrived with stylistic identifications appended by the archaeologists. None of the samples derives from good, independently-dated contexts (in this respect, these collections are typical of most others from the Andes). The advantages lay in the fact that all could be thin-sectioned, that the 'identifications' had been made very recently, and that, in the case of the Pikillacta, Ollantaytambo and Cuzco pottery, the sherds were considered to be representative of their types.

2. Piscaycucha (for description of site, building remains and previous surface collections, see Kendall 1985, 313-315)

On the north bank of the Urubamba, huge quantities of rubble, buildings and terraces cover an area of rolling upland. The buildings encompass every conceivable shape of ground plan, and include 'chulpas'. There has been no excavation. Soils are very thin.

Pottery is sparse. It was collected over a number of years, not in a random fashion: sherds were selected which had identifiable features of shape or decoration. Sherds of Ware 13 are fairly common, but the majority are of Ware 45, encompassing the entire Cusichaca range, and including some different, more elaborate types of decoration: 'face pots', in particular, are common, the face mask on the top half of waisted pots which have a bulbous profile above and below the waist (compare Ware 50: Appendix 1-3, fig. 13a; and see Rivera 1972, 110). In style, they resemble Cuzco Killke closely.

3. Ollantaytambo (for description of site and Inca levels see Valencia 1984, 225-246)

The fortress and the surrounding building complexes are Inca, but the existence and extent of any underlying pre-Inca occupation has not been investigated closely so far. The deposits containing the pottery submitted by Valencia were within Inca buildings, but were shallow, disturbed and of uncertain origin. The pottery includes sherds of Sample 24 (unidentified by Valencia); several sherds of an andesite-tempered ware (cf Ware 13 et al.) but with curvilinear and floral motifs (called 'Neo-Inca' by Valencia); a number of sherds of



Vare 45, similar in all ways to Cusichaca examples (called both 'Killike' and 'Lucre', the latter differing in having more disjointed motifs, blobs and elongated dashes of paint enclosed in nets of diagonal lines. Such motifs appear in Cusichaca on Ware 45); Ware 13 sherds, identical to Cusichaca examples, called 'Cuzco Inca'; and a small number of sherds of Ware 23, called 'Colla Inca': according to Valencia, these cooking pots were made on the Altiplano, and distributed very widely during the Late Horizon Period.

#### 4. Paucaritambo

'Ayllus' are Andean social units, akin to 'tribes', but whose compositions, territorial cohesiveness, and sizes seem to vary. The system is believed to be pre-Inca in origin, and some ayllus were certainly in existence during the Late Horizon Period: the Inca dynasty defined itself as an ayllu, and the chronicles further record that the Inca administrators fostered traditional ayllu identities as a means of encouraging productive competitiveness (see, e.g. Patterson et alia 1982, 63ff; Rowe 1963a, 253ff; Zuidema 1977, 257ff). Nowadays, some ayllus survive or have been revived, both urban (believed by some observers to be a recent manifestation) and rural. In Paucaritambo, the ayllus are particularly visible in various corporate town activities, and in spatial divisions within the plaza and the cemetery. The people have a strong sense of their ayllu identity, and distinguish themselves in various ways. Each ayllu has its own oral tradition concerning its origins and early development in the surrounding countryside, on land either still held by them or commonly recognised as being their traditional home, and

each *ayllu* has responsibility for maintaining the town's irrigation system where it crosses 'their' land. Urton has studied the Paucaritambo *ayllus*, and in 1981/82 made surface collections in each of the rural 'birthplaces'. The collections were studied for Urton to see if any variations could be attributed to *ayllu* distinctions.

The collections are all small, and most of the sherds are themselves small and abraded. There was, of course, no chronological context, and little indication of where or how the collections were made. The pottery was classified using the same parameters as those used for the Cusichaca pottery. Those wares which can be matched in the Cusichaca collections included 'Early Horizon' types (Marcavalle and Chanapata), Sample 24, Wares 13 and 15, and rare examples of Ware 45.

Of course, these collections are entirely unsuitable for isolating sources of variety. Nonetheless, the original idea was a good one, and it is possible that *ayllus*, particularly in their concentrated, urban forms, are archaeologically identifiable. A control study, using modern or recent evidence, would be instructive.

5. Pikillacta (for description of site and structures, see Kendall 1985, 281 and 336ff)

The relationship of this site and its satellites to the Huari state on the one hand, and its role in the emergence of the early Inca state on the other, have been much discussed; the date of its construction and the duration of occupation have been theoretically

shunted to and fro across the entire second half of the first millennium AD. The site has been excavated, but results have not been satisfactory: the soils are shallow, almost sterile, and their derivation is little understood or discussed. This pottery, all undecorated, comes from small test pits in the main compound, but no stratigraphic separation had been made. There are three types: the first, identical in shape, finish and fabric to Sample 24; the second, with a wiped finish, resembles Sample 400 in a general way; the third, which comprises thin-walled sherds from deep, incurving bowls with tapering rims, is identical to the sherds of Sample 425 from Q2-2 at Cusichaca.

All these wares were called 'Huari utilitarian'. Painted pottery from the same soils was called late or derived Huari.

#### 6. Surface collections

McEwan provided pottery which he had collected from the surface of sites adjacent to Pikillacta in the Lucre basin. The sherds had been identified by Barreda, and variously called Lucre A, Lucre B and Lucre-Killke. The Lucre A and B sherds looked identical to me, being thick-walled, painted in black and red in four-square patterns, with blobs in the centre of each square, and then vigorously polished to produce a leather-like, rippling surface. The Lucre-Killke sherds were similar, with slightly thinner walls: they were too small to tell if the designs were arranged in a diagonal or rectangular way. All had a dark appearance. With one exception, all were tempered with andesite. The Lucre A and B sherds were identical to Ware 15 at

Cusichaca (compare Appendix 1-3, fig. 4). The exception was one from the 'Lucre-Killke' group, superficially unlike the others in its higher tonal contrast of paint to body, and in its diagonal netting design. In thin section too, this sherd was identical to Ware 45.

McEwan also provided pottery from surface collections made in Ollantaytambo and Cuzco. Again, Barrera had made the identifications, and all were called 'Killke'. All were Ware 45.

The interest of these studies lies in the association of named styles with Cusichaca wares, and, more to the point, in the off-site distribution of wares which are amongst the most common in Cusichaca - Sample 24 and Wares 13 and 45. It is interesting that Ware 45 matches the Ware 13 distributions, although, to judge from these small collections, it is found in and to the north of Cuzco in quantity, but is much more rare to the south. This contrasts with Ware 15, which is extremely rare in Cusichaca, and was recognised otherwise only on sites to the south of Cuzco.

I have not been able to study at first hand any other Andean material from known contexts. For the purpose of this study, it was important to be able to make thin-sections, and for logistical or other reasons, this has not been possible so far.

## CHRONOLOGY

"... the only absolutely certain year in the history of the Inca Empire is 1532" (Meyers 1975, 8, quoting Wedin 1963).

I have followed Rowe's system (described in, e.g. 1962), for which the deep, stratified sequence at the site of Ica on the Peruvian coast (see frontispiece), provides "the most convenient point of reference" (*ibid.*, 49). The entire pre-Hispanic era is divided into periods of time. Each period has a distinctive cultural personality, identified in the Ica sequence by certain kinds of artefacts; and the dates of each period are based on the dating of those phenomena at Ica. The first, the 'Early Horizon Period', begins when Chavin-type pottery and artefacts appear in the sequence. This is followed by the 'Early Intermediate Period' (beginning with the first manifestations of more regional pottery types), the 'Middle Horizon Period' (Huari manifestations), and the 'Late Intermediate Period' (the second appearance of regional types). Finally, the 'Late Horizon Period' begins with the first signs of Inca influence in the sequence, dated to c.1470 AD. The other absolute dates and the durations of each period are given in Rowe and Menzel (1967, 2-3) but are, of course, liable to refinement if more radiocarbon dates for Ica become available.

Confusion has arisen sometimes because this system, which is based on absolute dates, has been mistaken for a relative scheme

which can be used descriptively. But, for example, the Late Intermediate Period/Late Horizon Period boundary is fixed by its Ica date, and does not shift to accommodate similar cultural events elsewhere. So, presuming that Inca influence permeated from Cuzco and its environs to the coast, the first signs of the Incas in the south central Andes will have occurred in the Late Intermediate Period (see below). Therefore, 'Late Horizon Period' and 'Inca Period' are not necessarily interchangeable names (Rowe pers. comm.).

There are insufficient radiocarbon dates for the later levels at Cusichaca to know where in the sequence the Late Horizon Period begins. I use 'Inca period' to refer to the local period of the Inca occupation, begging the question of whether this begins in the Late Intermediate or Late Horizon Period.

Where absolute dates are necessary in describing events in Cuzco, I follow Rowe (1963a, 203), who gives c.1200 AD for the beginning of the Inca dynasty, and 1438 AD for the beginning of Pachacuti's reign - in the Late Intermediate Period. About the date of the Spanish conquest, there seems to be no argument.

## GLOSSARY

Four sources have been used throughout to clarify technical terms: Henry Hodges, (Artifacts, 1964), Bernard Leach (A Potter's Book, 1976), Anna Shepard (Ceramics for the Archaeologist, 1956) and, failing all else, The Oxford English Dictionary. The only terms which need any other explanation or emphasis are these:

butt-welding = 'luting' (Leach): used here of attaching handles, as opposed to plugging, see below.

fabric = 'paste' (North America), 'body' (Leach). I use the word to mean all the materials of which a pot is formed, being clay with its own natural non-plastic inclusions (see below), if any, and with or without the addition of other materials by the potter (see temper below). The fired fabric is observed in fracture surfaces of sherds and in thin-sections.

facets: these derive from the polishing tool digging in to the leather-hard surface of the pot.

non-plastic inclusions or inclusions: all particles, of either mineral or organic origin, present naturally in the clay or deliberately added by the potter.

plugging: making a hole in the wall of a pot to push through the ends of a handle.

polishing = burnishing.

**self-slip:** a slip made from the same clay as that used for the fabric of the pot.

**style:** the outward appearance of a pot, including both its shape, the finish and the decoration.

**temper = 'opening materials' (Leach):** a category of non-plastic inclusion, but added deliberately by the potter to the clay.



Charts. Chronological and spatial distributions of wares

Contents and descriptions

CHART Z: Q2-1. Chronological distribution of wares, pre-Inca and Inca periods, in Area 22, and Buildings 17 and 20 (see Appendix 7, map 2: shaded area)

Phases are lettered A to R, from the bottom of the sequence to the top . . . . . p.288

Phase A: features cut into, and soils lying immediately on, bedrock; sealed by B soils and/or cut into by B features

Phase B: features cut into, and soils lying immediately on, A features/soils. Sealed by C soils.

(Phase C: lower terrace soil, overlying B features/soils; a ( (compacted) surface separates it from D.

first terrace (Phase D: upper terrace soil; occasional traces of pedo-logical development in the uppermost spits.

(Phase E: compacted surface (occasional) on the surface of the D soil, underlying the 'house' of Phase F in B17.

second terrace (Phase F: lower terrace soils in A22, B20, overlying first terrace (C/D), and underlying G. Also, house construction in B17, lying on E, underlying J.

terrace (Phase G: upper terrace soil in A22, B20, underlying H and J. (Phase H: latest terrace soil (sporadic) in A22, B20, overlying G and underlying J.

{Phase J: lowest Inca 1A soils (see Chapter 5 and Chart 1,  
{  
{ p.64) and house destruction, overlying house foundations  
{  
third { (F), and G and H soils.  
{  
terrace {Phase K: upper Inca 1A soils.  
{  
{Phase L: Inca 1A/1B soils, overlying K, underlying Inca 1B  
{  
{ (M) in B17 and B20, and Inca 2/4 (N to Q) in A22.

Phase M: Inca 1B soils in B17, B20, overlying L and under-  
lying N.

Phase N: Inca 2 features, cut into or lying on M in B17,  
B20. Also, lowest spit in soil overlying L in A22.

Phase P: Inca 3 soils in B17, B20, overlying M and N, and  
cut into by, or underlying, Q and R. Also, middle spits  
in soils overlying L in A22.

Phase Q: Inca 4 features, cut into or lying on P in B17,  
B20. Also, top spit in soils overlying L in A22. All  
overlain by building rubble, R.

Phase R: post-Inca: building rubble overlying P/Q in B17  
and 20, and Q in A22.

CHART A: Spatial distribution of wares, Inca period (combined), on  
Q1, Q1B, Q2-1, Q4-1 and Q10 . . . . . p.289

CHART B. Q2-1: spatial distribution of wares, Inca 1A to Inca 4  
(combined) . . . . . p.290

|                   |   |                                      |        |
|-------------------|---|--------------------------------------|--------|
| CHART D. Inca 2   | } |                                      | p. 291 |
|                   | } |                                      |        |
| CHART E. Inca 3   | } | Q2-1: spatial distributions of wares | p. 292 |
|                   | } |                                      |        |
| CHART F. Inca 4   | } |                                      | p. 293 |
|                   | } |                                      |        |
| CHART G. Topsoils | } |                                      | p. 294 |

CHART H. Q1: spatial distribution of wares, Inca 1A to Inca 4  
(combined).

CHART K. Inca 2 (Inca 2/4 in Areas) ) Q1: spatial distribution  
CHART L. Inca 3 ) of wares

CHART M. Topsoils in Q1: spatial distributions of wares.  
Canal burials: presence/absence of wares

| wares | 1 | 4 | 6 | 8 | 9 | 11 | 12 | 13 | 16 | 21 | 23 | 24 | 26 | 27 | 28 | 29 | 31 | 39 | 40 | 46 | 50 | 54 | 56 | 57 | 58 | 66 | 69 | 71 | 73 | 74 | <sup>S</sup> 24 | 126 | 155 | 176 | 400 | EH |
|-------|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----------------|-----|-----|-----|-----|----|
|-------|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----------------|-----|-----|-----|-----|----|

B

|    |   |  |  |  |   |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   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| B1 | . |  |  |  | . |  | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . 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|----|---|--|--|--|---|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--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Inca 1 & 3

[illegible]

2

| wares | 1 | 4 | 6 | 8 | 9 | 11 | 12 | 13 | 16 | 21 | 23 | 24 | 26 | 27 | 28 | 29 | 31 | 39 | 40 | 45 | 60 | 64 | 65 | 67 | 68 | 69 | 71 | 73 | 74 | 84 | 126 | 156 | 176 | 400 | EH |
|-------|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|----|
|       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     | A   |    |
| Q1    | . | . | . | . | . | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .   | .   | .   | .   | .  |
| Q2-1  | . | . | . | . | . | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .   | .   | .   | .   | .  |
| Q4-1  | . | . | . | . | . | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .   | .   | .   | .   | .  |
| Q1E   | . | . | . | . | . | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .   | .   | .   | .   | .  |
| Q10   | . | . | . | . | . | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .   | .   | .   | .   | .  |



[illegible]



| wares | 1 | 4 | 6 | 8 | 9 | 11 | 12 | 13 | 15 | 21 | 23 | 24 | 26 | 27 | 28 | 29 | 31 | 39 | 40 | 45 | 50 | 54 | 55 | 57 | 58 | 66 | 69 | 71 | 73 | 74 | 8 | 126 | 155 | 176 | 400 | EH |   |
|-------|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|---|-----|-----|-----|-----|----|---|
| B 1   | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |     |     |     |     |    |   |
| 2     | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |     |     |     |     |    |   |
| 4     |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |     |     |     |     |    |   |
| 5     | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |     |     |     |     |    |   |
| 6     | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |     |     |     |     |    |   |
| 7     | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |     |     |     |     |    |   |
| 8     | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |     |     |     |     |    |   |
| 9     | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |     |     |     |     |    |   |
| 19    | . |   |   |   | . |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |     |     |     |     | .  | . |
| 20    | . | . |   |   | . | .  |    | .  |    | .  |    |    |    |    |    |    |    |    |    | .  |    | .  | .  | .  | .  | .  | .  | .  | .  | .  | . | .   | .   | .   | .   | .  | . |
| 17    | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |     |     |     |     |    |   |
|       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |     |     |     |     |    |   |
| A 1   | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |     |     |     |     |    |   |
| 3     | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |     |     |     |     |    |   |
| 5     | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |     |     |     |     |    |   |
| 6     | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |     |     |     |     |    |   |
| 22    | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |     |     |     |     |    |   |
| 24    | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |     |     |     |     |    |   |
| 30    | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |   |     |     |     |     |    |   |
| 33    | . | . |   |   |   |    |    |    |    |    |    |    | .  |    |    |    |    |    |    | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | . | .   | .   | .   | .   | .  | . |

F

F

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| wares | 1 | 4 | 6 | 8 | 9 | 11 | 12 | 13 | 15 | 21 | 23 | 24 | 26 | 27 | 28 | 29 | 31 | 39 | 40 | 45 | 50 | 54 | 55 | 57 | 58 | 66 | 69 | 71 | 73 | 74 | 24 <sup>S</sup> | 126 | 155 | 176 | 400 | EH |   |  |  |
|-------|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----------------|-----|-----|-----|-----|----|---|--|--|
|       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | H  |                 |     |     |     |     |    |   |  |  |
| B13   | . | . |   |   | . | .  | .  | .  |    |    | .  | .  | .  | .  | .  | .  |    |    | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .               | .   | .   | .   | .   | .  |   |  |  |
| 14    | . | . | . |   | . | .  | .  | .  |    |    | .  | .  | .  | .  | .  | .  |    |    | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .               | .   | .   | .   | .   | .  |   |  |  |
| 15    | . | . |   |   | . | .  | .  | .  |    |    | .  | .  |    | .  | .  | .  |    | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .               | .   | .   | .   | .   | .  |   |  |  |
| 16    | . | . | . |   | . | .  | .  | .  |    |    |    |    | .  | .  | .  | .  |    |    | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .               | .   | .   | .   | .   | .  |   |  |  |
| 68    | . | . | . |   | . | .  | .  | .  |    |    | .  | .  | .  | .  | .  | .  |    |    | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .               | .   | .   | .   | .   | .  |   |  |  |
| 76    | . | . |   |   | . |    |    | .  |    |    |    |    | .  | .  | .  | .  |    | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .               | .   | .   | .   | .   | .  |   |  |  |
| 77    | . | . | . |   | . |    |    | .  |    |    | .  |    |    | .  | .  | .  |    |    | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .               | .   | .   | .   | .   | .  |   |  |  |
|       |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                 |     |     |     | .   | .  |   |  |  |
| A12   | . |   |   |   | . | .  | .  | .  |    |    |    |    | .  | .  | .  | .  |    |    | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .               | .   | .   | .   | .   | .  | . |  |  |
| 14    | . | . |   |   | . | .  | .  | .  |    |    | .  | .  | .  | .  | .  | .  |    |    | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .               | .   | .   | .   | .   | .  | . |  |  |
| 16    | . | . |   |   | . | .  | .  | .  |    |    | .  | .  |    | .  | .  | .  |    |    | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .               | .   | .   | .   | .   | .  | . |  |  |
| 18    | . | . |   |   | . | .  | .  | .  |    |    | .  | .  |    | .  | .  | .  |    |    | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .               | .   | .   | .   | .   | .  | . |  |  |
| 66    | . | . | . |   | . | .  | .  | .  |    |    | .  | .  |    | .  | .  | .  |    |    | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .               | .   | .   | .   | .   | .  | . |  |  |
| 67    | . | . | . |   | . | .  | .  | .  |    |    | .  | .  |    | .  | .  | .  |    |    | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .               | .   | .   | .   | .   | .  | . |  |  |

| wares | 1 | 4 | 6 | 8 | 9 | 11 | 12 | 13 | 16 | 21 | 23 | 24 | 26 | 27 | 28 | 29 | 31 | 39 | 40 | 45 | 50 | 64 | 66 | 67 | 68 | 68 | 69 | 71 | 73 | 74 | 24 <sup>S</sup> | 126 | 156 | 176 | 400 | EH |  |
|-------|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----------------|-----|-----|-----|-----|----|--|
| B13   | . |   |   |   | . |    |    |    |    |    |    |    |    |    |    |    |    |    | .  |    |    |    |    |    |    |    |    |    |    |    |                 |     |     |     |     |    |  |
| 14    | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                 |     |     |     |     |    |  |
| 15    | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                 |     |     |     |     |    |  |
| 16    | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                 |     |     |     |     |    |  |
| 68    | . | . |   |   | . | .  | .  | .  |    |    | .  | .  |    | .  | .  | .  |    |    | .  | .  |    |    | .  |    |    |    |    |    |    |    |                 |     |     |     |     |    |  |
| 76    | . | . |   |   | . |    |    | .  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                 |     |     |     |     |    |  |
| 77    | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                 |     |     |     |     |    |  |
| A12   | . |   |   |   | . |    | .  | .  |    |    |    |    |    | .  |    |    |    |    |    | .  |    |    |    |    | .  |    |    |    |    |    |                 |     |     |     |     |    |  |
| 14    | . | . |   |   | . | .  | .  | .  | .  |    | .  | .  |    | .  | .  | .  |    |    | .  | .  |    |    | .  |    |    |    |    |    |    |    |                 |     |     |     |     |    |  |
| 16    |   |   |   |   | . | .  |    |    |    |    |    |    |    |    |    | .  |    |    |    | .  |    |    | .  |    |    |    |    |    |    |    |                 |     |     |     |     |    |  |
| 18    |   |   |   |   |   |    |    | .  |    |    |    |    |    |    |    | .  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                 |     |     |     |     |    |  |
| 66    | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                 |     |     |     |     |    |  |
| 67    | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                 |     |     |     |     |    |  |

K

K

| wares | 1 | 4 | 6 | 8 | 9 | 11 | 12 | 13 | 15 | 21 | 23 | 24 | 26 | 27 | 28 | 29 | 31 | 39 | 40 | 46 | 60 | 64 | 66 | 67 | 68 | 68 | 69 | 71 | 73 | 74 | 24 <sup>S</sup> | 126 | 166 | 176 | 400 | EH |
|-------|---|---|---|---|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----------------|-----|-----|-----|-----|----|
| L     |   |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                 |     |     |     |     |    |
| B13   | . |   |   |   | . | .  | .  | .  |    |    |    |    | .  | .  |    | .  |    | .  |    |    |    |    |    |    |    |    |    |    |    |    |                 |     |     |     |     |    |
| 14    | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                 |     |     |     |     |    |
| 15    | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                 |     |     |     |     |    |
| 16    | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                 |     |     |     |     |    |
| 68    | . | . | . | . | . | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .               | .   | .   | .   | .   | .  |
| 76    | / | / |   |   |   |    |    |    |    |    |    | /  | /  |    |    | /  | /  | /  | /  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .               | .   | .   | .   | .   |    |
| 77    | . | . |   |   | . |    |    |    |    |    |    |    |    | .  | .  | .  | .  |    |    | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .  | .               | .   | .   | .   | .   | .  |
| A12   | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                 |     |     |     |     |    |
| 14    | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                 |     |     |     |     |    |
| 16    | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                 |     |     |     |     |    |
| 18    | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                 |     |     |     |     |    |
| 66    | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                 |     |     |     |     |    |
| 67    | / |   |   |   |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |                 |     |     |     |     |    |

 Inca 4

[illegible]